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Gough Adds.
Norfolk.
8°. 59.

Dawson Turner.
1826.

GEOLOGICAL
AND
HISTORICAL
OBSERVATIONS
ON THE
EASTERN VALLIES
OF
NORFOLK.

BY J. W. ROBBERDS, JUN.

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ADVERTISEMENT.

The following observations were, for the most part, written before the idea of making Norwich a Port was publicly entertained. They form the beginning of a series of Essays, designed to illustrate the geological changes, which our globe has experienced. The Author is induced to publish them, in this detached form, not only because they relate to the structure of that district, through which the proposed navigation is to be carried, but also, because they disclose facts, which have an important connection with that subject. It cannot be otherwise than satisfactory to the advocates of the measure, to find, that their plans, if realized, will follow the original course of nature, by restoring what appears to have been the most frequented entrance to the ancient Garienis. But, if the level of the German ocean be gradually falling, the most material point for them to consider is, how far the prospect of such a change ought to be taken into account, while arranging the details of their undertaking. Nor will the inhabitants of Norwich be less impressed with the necessity of attentively watching a circumstance, the progressive operation of which, if not counteracted, must in time deprive their city altogether *of the benefit of a navigable river. Many instances might be adduced to shew that such a fear is neither idle nor chimerical. The measure in contemplation has, at least, the merit of combining the means of providing against such a misfortune, with the advantage of opening the least circuitous channel, by which we can reach the sea.*

Norwich, Sept. 6th, 1826.

INTRODUCTION.

The subtleties of the casuist, and the dreams of the visionary, however ingenious and amusing, afford no longer sufficient ground for reason to build systems upon. All sound and true science must now be derived from intelligible facts; and in proportion as these facts come under our immediate cognizance, or are supported by satisfactory evidence, in the same proportion do the conclusions drawn from them establish their authority and influence our judgment. Geology is a science which professes to adhere with peculiar tenacity to this principle. The deep obscurity in which the objects of its researches are involved, and the failure of so many premature attempts to remove the mysterious veil, not only justify the caution now observed in this study, but form also a two-fold motive for engaging in its service all that strictness of demonstrative proof by which the exact sciences are distinguished.

Yet the phænomena which geology investigates, are of such a nature as seems almost to preclude all possibility of the proof that is required. They are, all of them, the results of operations, which appear to have preceded the very existence of man, and which have certainly never come within the sphere of his observation, as an intelligent, reasoning, and enlight-

ened being. However scientifically, therefore, he may arrange and classify the various mineral bodies which he now surveys—however assiduously he may mine his way through successive strata, analyzing their materials and determining their extent—still he has hitherto become acquainted with nothing more than *the effect—the cause* remains buried in the gloom of that remote antiquity which it seems impossible that the severe tests of modern science should ever reach.

This difficulty—if it be surmountable—can, in my opinion, only be overcome by carefully studying, in the first instance, the latest earth-forming process which can be traced on the surface of our globe. Our researches ought, therefore, to begin with the most recent alluvial deposits. The facts which they present must of necessity come nearer than those of any other class within the range of actual observation; nor is it impossible that the pages of history may furnish information from which we may ascertain the progress of change, at some of these points, even in times comparatively modern. Thus alone may we hope to collect a mass of evidence so positive as to satisfy the strictness of analytical investigation; and if by these means any general geological principle can be shewn to have prevailed, or to be still at work, in these formations; and if, by analogous appearances, the same principle may be traced in the preceding strata, we shall thus certainly accomplish a most important step towards developing the nature of those great revolutions which the surface of our earth has unquestionably undergone.

The agency of water in consolidating at least the uppermost strata of our globe, is proved by evidence no less satisfactory, than that which establishes the operation of the same means in forming the latest alluvial beds. These may be said to be the only points on which all classes of geologists are agreed! But in both these cases the same difficulty occurs. How have these alluvial deposits been left dry? How do these strata occupy positions so far above the present level of those waters, in the bosom of which they were consolidated? It is unnecessary to recapitulate the various attempts that have been made to answer these questions, or to enter into the controversies to which they have given rise; all that has hitherto been written on the subject, has proved so unsatisfactory, that the geologists of the present day have, as it were by general consent, abandoned the discussion, and confined their views to the collecting of such a mass of facts, as may lay a sure foundation, at some future period, for an universal and all-explaining theory. Whether this foundation be, as yet, sufficiently firm, will be doubted by many; and commensurate with the strength of their doubts, will be the severity of their censures upon the rash and presumptuous adventurer, who dares to try the ground, that has proved fatal to so many before him. Yet unless such efforts be made, and the risque of failure be boldly encountered, with a generous disregard of personal consequences, the progress of this science will be altogether suspended, and all that has hitherto been done will continue useless; the most acceptable return—the most grateful compliment—that can be

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offered to the eminent and active minds, so long engaged in these labors, must surely be—to endeavour to improve the materials they have assembled, to connect the facts they have recorded, to collate the observations they have made, and to combine the principles they have established.

It may be hoped that these considerations, if they do not overcome the doubts, will at least disarm the severity of those, who are still of opinion that all attempts of the kind must be premature, fruitless, and dangerous. Whatever be the fate of the conclusions drawn in the following essay, the premises from which they are deduced, must always be useful to the science, of which they illustrate an important branch. The original observations which they present, are confined to a small, though interesting and hitherto neglected, district. But the degree of importance appertaining to facts, as guides of philosophical enquiry, often depends less upon their intrinsic weight, than upon the relation which they bear to other phænomena. Thus, like the last grain that turns the doubtful balance, some local circumstance, trivial perhaps in its nature, may acquire consequence by completing a chain of connected evidence; occurrences, minute, trifling, and even apparently trite, may upon a closer investigation, be found to present peculiar features, which, included in a wider survey of correlative cases, will decide a long contested question, and establish a leading general principle in some branch of physical science. This law of investigation seems, however, to have been very frequently neglected in geological enquiries. A great variety of local facts have been observed; in many instances they have been simply put upon record without comment, or any attempt to explain their causes. But where a different course has led to speculations upon the means by which they have been produced, the narrowest and most unsatisfactory views of the subject have often been presented to our consideration; the appearances contemplated have been treated as isolated objects, without any reference to analogous effects, existing in situations and under circumstances, fatal to the partial conclusions so hastily drawn. Thus, whereever subterranean or sub-marine traces of ancient forests have been discovered, it is usual to infer, that in such spots a subsidence of the land has taken place, without enquiring, if this solution can be admitted at all the various points, where these remains occur, and on the extensive scale which their frequency would require. The marine *exuviæ*, so abundantly distributed over our present continents, have in all ages, although in different degrees, been held to be certain and contemporaneous proofs of an universal deluge; nor has science completely succeeded in exploding this opinion, by pointing out the gradations of change which these phænomena exhibit, the uniform allotment of distinct tribes to particular strata, and other circumstances, which indicate plainly, that the arrangement, now beheld on the surface of our globe, has been the result of successive revolutions, at long intervening periods of time. In like manner, the superficial beds of sand and gravel, the fossil remains of land-animals and plants, the excavation of deep vallies, and other marks which point out the former course of agitated waters, are not only believed to confirm the traditional records of such a catastrophe, but are even *scientifically* arranged in the class of *diluvian remains*, without adverting to those considerations, from which it will be evident that these appearances—so far from being universal and coeval—are the effects of operations, widely distant in their æras, diversified in their nature, limited to particular situations, and necessarily slow and gradual in their progress. So also the encroachment of the ocean on some shores, and the retreat of its waves from others have been regarded as mere local changes, without enquiring how far they may depend upon some great law of nature, by which the movements of the wide world of waters are invariably regulated. Minute, and sometimes accidental, varieties in the structure of granite, grauwacke, or basalt, have been supposed to afford decisive evidence of the aqueous or igneous origin of these substances, without, in either case, tracing them back to the metallic bases from which they were first derived, or comprehending in the process of their formation, the other rocks, with which they are now associated. This mode of conducting our enquiries, however just and accurate at the outset, still, by having been so exclusively pursued, has too much diverted our attention from the grander features of nature; while studying the peculiarities of cabinet specimens, we have neglected the general character of the mass to which they belong; and the puny effects of the crucible and blow-pipe have been more regarded, than those of the rock-melting volcano, or the phænomena of those wandering worlds of fire, whose eccentric paths we so frequently watch in the heavens.

The present is the first of a series of essays, in which I shall endeavour to avoid these errors, and to combine the two principles of enquiry, which it has been the object of these introductory remarks to establish. For this purpose, I shall in the first place investigate the physical and historical records of the change that has taken place in the condition of the eastern vallies of Norfolk, a district which offers some highly important and instructive facts, relating to one of the most recent formations of land, that can be found on the face of the globe. In a future essay I shall point out the connection between these facts, and all the various alterations, that have been observed, or that are still constantly occurring, on the shores both of the nearest and most distant oceans; and I propose finally to show the basis which these materials afford, for an established principle in geology, applicable to all the different strata, that compose the superficial crust of our earth.

In selecting the eastern vallies of Norfolk for the foundation of my argument, I have been influenced by many different motives. All human reasoning of course sets out from some given point. The mind receives its first impulse from the objects casually encountered in its daily pursuits; and its enquiries, thus naturally beginning at home, in their progress add link after link to the chain of inference, till they finally complete the circuit of the field which they are exploring. To have thus conformed to the order of nature, might perhaps be a sufficient excuse for the course I have adopted; but it may not be useless also to remark, that a constant residence of many years in the neighbourhood of these vallies, has afforded me frequent opportunities of verifying the observations I have made in them. I think it the more necessary to state this, because they present, at different points, those very appearances, which have hitherto been sought in vain by one class of geologists; the want of such corroborative evidence having been often triumphantly urged, by another class, as a fatal objection to conclusions, otherwise well supported, may not the discovery of such facts, in an hitherto neglected quarter, tend to settle the question? With these views I am anxious to call the attention of men of science to a district, in which the latest operations of the plastic principle may be so clearly traced. Should I succeed in giving this direction to their researches, my object will be attained; and whether the result be to confirm, or to disprove, my own inferences, the cause of science will in either case be equally promoted. My enquiries have been conducted, free from the bias of a pre-conceived attachment to any system, and in forming my opinions I have been guided by facts alone, as I found them. The desire of promulgating those opinions, is subordinate to the better ambition of being instrumental in the propagation of truth, the knowledge of which, whether speculative or practical, must always advance the highest interests of our nature. The pursuit of that knowledge is the great concern of man below; the attainment of it elevates him in the scale of being—enlarges his moral perceptions—by slow and distant approaches assimilates his views to those of the supreme, all-perfect Spirit—and insensibly forms the exertion of his powers to harmonize with the ends, for which he feels, and thinks, and acts, on the busy scene of conscious existence. To have assisted in the diffusion of that knowledge, is a distinction worth contending for; the honest satisfaction which attends it, soothes and cheers the mind, through the laborious discharge of duty; and its influence shall still survive, when the ephemeral reputation of brilliant sophistry, and the proudest titles of worldly honor, sleep forgotten and inglorious with the silent dust, to which they once gave an empty, fleeting, and perishable name.

GEOLOGICAL AND HISTORICAL OBSERVATIONS ON THE EASTERN VALLIES OF NORFOLK.

The eastern part of the county of Norfolk is known to geologists, as the northern termination of what is called the London basin. This basin is of a triangular shape, having on its eastern side the German ocean, and on the west and south, two ridges, branching from the great chalk formation of our island; the first and longest of which is a range of hills, commencing on the coast of Norfolk, near Burnham, and extending thence in a south-westerly direction across parts of Suffolk and Cambridgeshire, and through the counties of Bedford, Buckingham, Oxford, and Berkshire into Hampshire, where it joins the principal mass of that formation. From that point another ridge of the same description stretches to the eastward, and traversing Surry and Kent in a line nearly parallel to the course of the Thames, terminates on the sea-coast, in the bold cliffs of the North Foreland, and constitutes the southern boundary of this enclosure. Within the area circumscribed by these limits, occurs a series of strata, which, both from their position and the nature of their organic fossils, appear to be contemporary with the formations in the Paris basin, so ably illustrated by M. M. Cuvier and Brogniart; and to present also the same alternations of fresh water and marine beds, as have been found in that district.* It is only of late years that these strata have been regarded with the attention, of which they are worthy; nor have they, even yet, been satisfactorily explored throughout the whole of their extent. The best account of them will be found in the following papers, published in the Transactions of the Geological Society—viz. Mr. Parkinson, on the strata and fossils near London (Vol. 1st)—Mr. Webster, on the strata over the chalk in the south-east of England (Vol. 2d)—Professor Buckland, on the plastic clay formation (Vol. 4th)—and in Messrs. Conybeare and Phillips' Outlines of the Geology of England.† These writers, however, have almost exclusively confined their observations to the deposits that fill the lowest hollow of this basin in the more immediate environs of the metropolis, from which the most important of these beds has been denominated the London blue clay. The extensive accumulations of sand and gravel, which constitute the superficial covering of nearly the whole basin, and which in the northern portion of it, rest upon the chalk itself, frequently in vast masses, have been generally neglected, or at most slightly noticed.‡ In Smith's geological map of

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* Mr. Webster—Geol. Trans. Vol. 2, p. 173.

† There is also some interesting information on this subject in Mr. Trimmer's account of Organic Remains found at Brentford, in the Philosophical Transactions for 1813.

‡ Mr. Richard Taylor has furnished in the Geological Transactions, 2d Series, Vol. 1, and in the Philosophical Ma-

Norfolk, the greater part of the surface of this county, within the chalk basin, is delineated as consisting of "brick earth and sand, with pebbly gravel and crag* occasionally." Other writers commonly designate these beds by the general term of *diluvial*, thereby referring their origin to the disintegration of older rocks by the action of the waters of the deluge. I shall not stop now to discuss the manner of their formation, but merely observe, that the characters which they exhibit are universally allowed to be those of the uppermost and latest of all marigenous strata, anterior to those recent local deposits, which are distinguished by the name of *alluvial*; and that the waters in which they were accumulated must have flowed at an elevation of more than 300 feet above the present surface of the neighbouring ocean. The light-house cliff at Cromer, according to the measurement of Mr. Richard Taylor,† is 320 feet above the beach at its foot; from which height the face of the country gradually declines towards the south and east, in a suc-

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gazine for August, 1822, and January, 1824, almost the only information that has yet been published respecting the geology of this part of Norfolk; it may be hoped, however, that in the next volume of Geological Transactions, this terra incognita will be still farther illustrated, not only by the pen and the pencil of this gentleman, but also by the united observations of three distinguished members of the society, who in the autumn of 1823 visited some of the interesting points of this district.

* This is a Suffolk term for gravel, and is used geologically to denote a bed of hard sand and gravel, mixed with fragments of shells. See the Introduction to Pennant's Arctic Zoology, page 6, and Conybeare and Phillips' Outlines of the Geology of England, page 11.

† Philosophical Magazine for January, 1824, p. 6.

cession of gently undulating slopes, intersected by those vallies which it is my more immediate purpose to describe.

Of these vallies, the largest is that of the Yare, through which the river of that name flows from Norwich to Yarmouth. At the former point the width of this valley is not more than from two to three furlongs; but it expands gradually, as it approaches towards the sea; for about sixteen or eighteen miles it holds a somewhat winding course to the south-east as far as Reedham, where it turns due north for a considerable space, till between Burgh Castle and Herringby it bends full to the east, and proceeds in that direction to meet the German Ocean, between Caister on the north, and the heights of Gorleston on the south. In the centre of this opening, which is about four miles wide, stands the sea-port of Great Yarmouth.

About six miles to the north of this valley, and nearly parallel to it, runs that of the Bure, which, uniting with some smaller vales, becomes a wide tract of lowlands, interspersed with some insulated plots of rising ground, still called *Holms*; this tract, on the south, joins the valley of the Yare between Acle and Stokesby; and on the north-east meets the German Ocean at two breaches in the cliff, the largest of which is about two miles wide, and known by the name of Horsea Gap. Farther to the south, between Norfolk and Suffolk, is the valley of the Waveney, which proceeds in an easterly direction, till, opposite to Whitaker Burgh, it divides into two branches; one of these, turning to the north-west, joins the valley of the Yare, between Haddiscoe and Herringfleet; the other, proceeding due east, through the narrow basin that is occupied by Oulton Broad and Lake Lothing, meets the German Ocean in Suffolk, at the opening in the line of cliffs, between Lowestoff on the north and Kirkley on the south.

These vallies consist of a series of meadows and marshes, differing altogether in appearance and character from the heathy knolls and champaign country of the intervening uplands; where they approach the coast, they are separated from the sea by narrow belts of shingle and sandy dunes, about a quarter or half a mile in breadth, which stretch across the different openings. Their soil is a deep alluvial mud, intermixed sometimes with extensive beds of peat; their surface being very little elevated above the rivers that flow through them, and the lakes (or broads, as they are locally termed) which occupy their lowest hollows, many parts of them are generally under water during rainy seasons and most of the winter months; but the farther these tracts recede from the sea, the less subject are they to such inundations, and the more compact and stabile* does the ground become. In the summer they yield abundant crops of coarse hay, and afford pasturage to numerous herds of cattle. Yet it may be shewn by a great variety of facts, that these vallies, some parts of which now present smiling and luxuriant landscapes, not unworthy of the pencil and genius of another Claude, were at no very distant period arms of the sea, navigated by our forefathers, and that from such a state they have been, and still are, gradually converting into solid and productive land. The proofs of this change are both physical and historical; I shall class them under these two heads, and consider each of them separately.

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* That the critical reader may not condemn my orthography, or suspect the printer of an unnoticed inaccuracy, I beg to refer him to page 289 of the excellent work on British Synonyms by Wm. Taylor, Esq.

1st—*Physical proofs of the former residence of the sea in the vallies.*

A single glance at the annexed sketch of this district will be sufficient, in order to perceive the connection between its vallies and the German Ocean, and the resemblance which their outline bears to the forms generally exhibited by æstuaries and inlets of the sea. Gradually enlarging as they approach towards the coast, and branching off, so as mutually to join each other, they surround the more elevated lands, and give them the appearance of islands, like those which still exist in the hundreds of Essex, or perhaps corresponding more exactly with those which compose the province of Zealand on the opposite shores of the Netherlands. It may also here be remarked, that all the smaller inland dales and combes descend in the same manner to meet these vallies, and that all the springs and rivulets throughout the eastern part of the county (except two small brooks that flow into the sea at Mundesley and at Bacton) unite with the different rivers, which now discharge their collected waters at Yarmouth haven.

It is now generally admitted, upon the most satisfactory evidence, that the vallies which traverse the face of the earth, were originally excavated by the action of powerful currents of water. In the instances now before us, this operation must have taken place on the surface of the chalk, for it is in hollows of that stratum, that the eastern vallies of Norfolk repose. All geological writers who have treated of the chalk formation, have noticed the inequalities of its surface; and indeed, knowing that it contains so many extensive and deep basins, we are authorized to conclude that still lower depths may be found in those basins themselves. Cuvier and Brogniart in their researches in that of Paris, not only traced "des enfoncemens et des saillies, qui y formoient des vallées, des collines, ou des buttes," but they also observe that these must have existed prior to their being covered by the more recent beds.* In the same manner the undulations of the upper surface, at least in the Norfolk part of our London basin, denote corresponding irregularities in that of the chalk; for many instances may be pointed out in which the nuclei of the hills are formed by hummocks of this lower stratum. This may be seen at many points along both sides of the valley of the Yare; in the pits of Musholt Heath, of Thorpe, and Postwick on its northern skirt, and in those of Carrow, Trowse, and Whitlingham on its southern, the chalk rises considerably above the level of the intervening meadows; if it presents any natural denudations, they are partial and limited in their extent, and clearly attributable to local and accidental causes; nor does it exhibit, in either escarpment, any precipitous cliffs, capped with gravel, which must have been the case, if these vallies had been scooped out by eroding streams, since the formation of those beds of loose fragments, called diluvial, which I have already noticed. But, on the contrary, these beds not only cover equally the summits and the declivities of the chalk, but also sink on both sides below the deposit of alluvial mud; and wherever this soil has been bored through—as in digging wells in the lower part of the city of Norwich—they are again met with; but it seldom occurs that these perforations penetrate far enough to reach the chalk.

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* Recherches sur les ossemens fossiles. Tom. 2d, p. 253.

From these facts then it appears, that the valley of the Yare, and, by inference, those also of the Bure and the Waveney, were originally longitudinal basins of chalk—that by a subsequent geological operation, they were lined with coats of gravel and sand—and that at a later period, their lowest bottoms were filled up by another and distinct layer of earth. Thus far the general features of this district coincide with the view that has been taken of its former condition, and prove that after the departure of that ocean, by which it had been covered with a detritus washed down from higher levels, these vallies continued to be occupied by a body of water, that has deposited within them a more recent formation. The materials of that formation will prove, that the waters by which they were left were those of the neighbouring ocean.

The upper part of this bed, from the regular evenness of its surface, the oozy sediment of which it consists, and the abundant mixture of decayed aquatic plants which it contains, is evidently of fresh water origin. Its thickness is very various; in some parts, from its nature, it is impossible to dig into it to any great depth; in others, where it is more compact and raised above the present level of the river, layers of sand, mixed with common marine shells, are found sometimes within two or three feet of the surface. Camden, in his Britannia,* states that "cockles" had been dug up near St. Benedict de Hulmo, from which it was inferred that the sea formerly extended to that neighbourhood. This ancient abbey was built, as it name imports, on a small island, now forming part of the valley of the Bure; in that of the Yare the labourers employed in cutting drains frequently meet with the same fossils. The meadow bank of the river, between the Foundry and Carrow Bridges, presents, when the water is low, a bed of fossil shells, some fluvial and some marine, lying in a sandy stratum immediately under the superficial deposit of black alluvial mud. In the year 1805 I was present at the sinking of a well in the garden lately occupied by Dr. Alderson, in the parish of St. Clement, in Norwich, where at about 10 feet below the surface, a bed of shells was found, consisting almost entirely of the Cardium edule, in a very perfect state of preservation.

But the most remarkable of these shelly deposits are found extending along the declivities of the hills on both sides of the valley of the Yare, and uniformly at the same elevation of about forty feet above the surface of the interjacent meadows. As this fact furnishes most important data, and leads to highly interesting conclusions, it will be satisfactory to describe these beds more minutely, and to determine with some degree of accuracy their nature and character. The first point at which I observed them, in the year 1814, was on a projecting ledge of the Bramerton Hills, which Mr. R. Taylor has described in the last Geol. Trans. and which probably supplied the specimens delineated in Sowerby's Fossil Conchology. I next traced them, a few hundred yards more to the eastward, in a ditch which forms the boundary between the parishes of Bramerton and Surlingham. This ditch, ascending the side of a steep hill, near the bank of the river, intersects at the height of forty feet a layer of sand and shells about three or four feet thick. Similar shells have also been found by Dr. Yelloly in his grounds at Carrow Abbey. These points are all on the southern side of the valley. On the opposite side I have explored precisely analogous beds in Postwick Grove, in the chalk pit near the Lunatic Asylum at Thorpe, and in other pits just beyond the turnpike gate. In all these instances the shells lie imbedded in a layer of loose sand, as nearly as possible at the same elevation of about forty feet above the adjacent valley. In the Philosophical Transactions for 1746, Mr. Arderon, F.R.S. has given an account of a bed of shells, bearing in every respect the most perfect resemblance to these. He noticed it at Cantley, a village also on the northern side of this valley, at an intermediate distance between Norwich and Yarmouth. These shells he represents as lying 42 feet (14 yards) above the surface of the Yare, and extending in a bed of about two feet in thickness, nearly parallel to the horizon, on the side of a long chain of hills, sometimes near the banks of the river, and "now and then about a furlong or two distant from it;" "these hills," he adds, "I take to have been formerly the boundaries to an arm of the sea."* Mr. Ives† also mentions a stratum of the same kind, near the ancient walls of Burgh Castle, on the side of a rising eminence, which overlooks another part of this valley, but is entirely detached, by the intervening stream of the Waveney and its adjacent low grounds, from all connection with either of the above-noticed chains of hills.‡

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* Gibson's Edition, p. 390.

The following are the striking and peculiar characters of these beds of shells.

1st—None of them, except a few casual specimens, belong to any extinct or even rare species; but they consist entirely of the littoral shells, which now abound in the German Ocean, and are constantly met with on its shores, or in the æstuaries into which its tidal waters flow. The principal of them are:

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* Phil. Trans. abridged, Vol. 10, p. 592.

† Enquiry concerning Garianonum, p. 9, 10.

‡ Similar accumulations of shells are found in the continuation of the same valley, on the western side of Norwich; and it is worthy of notice, that, although they are only about 15 feet above the surface of the river, still as the river itself is raised by four intervening mill-dams, it must be there at least 25 feet above the level at which it flows below Norwich, and consequently these shells must occupy the same relative elevation, or, in other words, must lie in the same plane, as those which I have already described.

Buccinum Undatum,* in large quantities.
Tellina, different varieties, also numerous.
Cardium edule.
Turbo littoreus.
Lepas tintinnabulum. Linn. (*Balanus* of Lamarck.)
Mactra, several varieties; all in fragments.
Mytilus edulis.

The *buccina* and *tellinæ*, but especially the former, may be considered as the characteristic fossils of these beds. Amongst many hundred specimens which I have examined, I have never found one of the *Buccinum fossile heterostrophum* of Dale,† which is peculiar to the Crag stratum.

2d—Many of them, particularly the *Buccina*, are still very perfect and in excellent preservation; some of them retaining their nacre and transparent property. Mr. Arderon also remarks, in his account of the shells at Cantley, that "of the common whelks *(Buccina)* some are very perfect." Many of the *tellinæ* also are entire, but so brittle, that the greater part crumble in the attempt to remove them; the countless fragments mixed with the sand in which the whole are imbedded, seem to belong generally to this species.

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* Mr. R. Taylor, in his enumeration of the Bramerton shells, (Geol. Trans. 2d Series, 1st Vol. p. 373) has classed these under the *genus*, *Murex*. Conchology is still very unsettled in its generic distinctions; Linnæus, whom most naturalists still follow, gave the name of *Murex* to all turbinated shells *with an oval aperture ending in a straight gutter;* that of *Buccinum* is used, on the same authority, where this canal *leans to the right, with a retuse beak and the inner lip expanded.* All the shells, which I have thus designated, shew most decidedly these last-mentioned characters.

† History of Harwich. Appendix, p. 257. Mr. R. Taylor, in the paper already referred to, considers these beds as a continuation of the Suffolk Crag. The want of this particular fossil would alone be fatal to his opinion. But I cannot help suspecting that some of our most active geologists in their earnestness for the discovery of new strata, have given the names of Crag, Plastic Clay, &c. to what will hereafter be found to be local independent deposits. I have used the term *Crag Stratum* in compliance with a prevailing theory, not from a conviction that it is correct.

3d—These beds are found at various places, on opposite sides of the valley, and uniformly at the same height.

4th—They appear in most instances not to extend beyond the face of the hills. At Bramerton, wherever the original declivity has been worn away by the springs, which are very abundant there, or cut down for sand or gravel, the continuity of the line of shells is broken, and no traces of them remain, except in numerous fragments which may be discovered in the superficial soil between the foot of the hills and the bank of the river. Even the layer which I first noticed has been nearly exhausted in ten years, by the slips or removal of the underlying sand. At Cantley the progress of cultivation appears to have destroyed, in the course of eighty years, all traces of the bed of shells, described by Mr. Arderon; the hills remain, as delineated by him; but their sides are now covered with arable land, to the very edge of the marshes, and I have not been able to discover any vestiges of the deposit, which attracted his attention. I have explored almost all the chalk, gravel, and sand-pits in Surlingham, Bramerton, and Whitlingham on the southern side of the valley, and in

Thorpe and various parts of Musholt Heath on the northern, and have found no remains of any bed of shells, wherever the original face of the hills has been much cut away, or in any situations at all removed from the side of the valley. In one of the pits near the turnpike gate in Thorpe, a section of the bed of shells was lately laid open, which shewed that it gradually shelved off to a point as it receded from the valley, and soon terminated. It is also worthy of remark, that at this place a lower and more ancient bed of shells may be seen not far above the surface of the chalk; the fragments, though numerous, are so minute, that it is impossible to determine their species, and they are tinged of a deep yellow by the highly ferruginous nature of the sand with which they are blended. Between the surface of the chalk and this bed, is interposed a layer of water-worn flints, among which fossil bones have been found; they were unfortunately thrown aside and lost; but from the description given of them by the workman by whom they were discovered, they seem to have been the tibia of a land-animal of the horse or stag kind. The upper or recent bed of shells has, at this point, as well as at many others, a superficial covering of not more than two or three feet in depth, and consisting in great part of vegetable earth. In Postwick Grove this vegetable earth itself is full of minute fragments of shells. Some traces of them have also been discovered in the village of Kirby Bedon, at the distance of about a mile from the borders of this valley; but these occurred in a narrow dell or combe which runs up into the country between Bramerton and Whitlingham, and which must have been a bay or inlet, at the period when, as the facts we are considering seem to indicate, the main valley itself was an arm of the sea.

There are however some instances, in which this bed of shells *appears* to penetrate into the body of the hill, on the side of which it is found. I say *appears*, because no excavation of sufficient magnitude has yet been made to establish the fact. But wherever this appearance takes place, I have observed, not only that the shelly layer is inclined at a very considerable angle towards the valley, but also, that as it recedes from the face of the hill its character undergoes a very material alteration; the *buccina*, of which it chiefly consisted when it was first laid open, become gradually less frequent and finally disappear; the tellinæ which remain are for the greater part crushed into fragments, and the whole bed becomes harder and more compact, decreases in thickness, and assumes a near resemblance to what is denominated the *Crag stratum.*

5th—I found among these shells the vertebræ of some small fish and bones of land animals; also some tufts of decayed vegetable substances, evidently *in situ*, which bear a strong resemblance to some species of *fuci*, so commonly washed up at the present time by the waves upon the neighbouring shores. Mr. Arderon also mentions a piece of coal which he met with at Cantley, just in the same manner as pieces of this mineral may be every day seen on the beach at any part of our coast. Mr. R. Taylor likewise discovered fragments of lobsters and crabs, and of wood and coal, at Bramerton.

All the circumstances presented by these beds of shells are strikingly and decidedly characteristic of a former strand or beach. An extended line of sand and pebbles, stretching at one uniform elevation along the side of a range of low hills—similar in its nature and appearance to that which universally skirts the ocean—and mixed with shells, some broken and some perfect, with drifted decayed vegetables (whether fuci or not) and with such other substances as the retiring tide now leaves on every shore—this exhibits all the strongest features of a permanent boundary between land and water; and with these vestiges before us, we cannot but conclude, that at some former period and for a considerable length of years, this was the insuperable barrier, on which the chafing breaker spent its idle fury and washed up the relics of its shattered spoils. Nor are these the vestiges of that ancient ocean, which, in ages unfathomably remote, covered the whole of this district, and formed the masses of sand and gravel, by which the chalk is here overlaid; for it is certain that they are not universally distributed through those masses; and as far as my observations have extended, I have never found them beyond the immediate skirts of this valley, or its contiguous branches.* And though, as I have before remarked, these beds appear sometimes to penetrate beyond the face of the hills, still it must be remembered, that as they recede from the valley, they undergo a material change of character and assume a decided aspect of greater antiquity. Hence it appears probable, that the earlier ocean, which from the evidence of the Cromer Hills occupied an elevation of more than 300 feet above the present surface of the sea—at the period of the last great change experienced by our earth, settled and long remained stationary at a level corresponding with that of the more recent beds of these shells;—that during the course of its depression, those more ancient and compact deposits were formed, which bear some affinity to the *crag stratum*; and that subsequently to that revolution, this valley was an æstuary, the shores of which were inhabited by the *buccina*, the *cardia*, the *tellinæ*, and the *turbo littoreus*, whose abundant spoils now compose the exterior portion of these beds.

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* Some persons have endeavoured to account for this fact, by assuming, that the stream which scooped out the valley, cut through a succession of horizontal strata, which are concealed beneath the surrounding higher lands, and laid bare on each side a section of them. Mr. R. Taylor seems to hint at such an idea, when he says, that "between Lowestoff and Bramer-

From this review of the physical circumstances disclosed by these vallies, the following conclusions may be drawn.

1st—The shells found either below the soil that fills their basins, or on the sides of the surrounding hills, are unquestionably marine; they were *therefore* deposited by the waters of the sea.

2d—They contain no exuviæ that are peculiar to

ton the crag shells are concealed beneath deposits of alluvial gravel, sand and clay." But they forget that these shells are found every where under the mud which covers the basin of the valley; nor have I ever been able to discover similar beds of perfect shells, overlying the chalk, in any of the circumjacent higher grounds.

the older strata, but all resemble those of the testaceous molluscæ* now found in the neighbouring ocean, towards which these vallies all open, and above which the surface of their meadows and marshes is even now very little raised; *therefore* the sea by whose waters these deposits were formed, was the German Ocean.

3d—These beds of shells and other coincident traces of an ancient beach, are found at different points, on both sides of the valley of the Yare, about 40 feet above its present surface; *therefore* the waters of the German Ocean once flowed up, and permanently occupied this valley at that elevation.

4th—The vallies of the Bure and the Waveney are upon the same level, and so intimately connected with that of the Yare, that the tides which were admitted into the one, could not be excluded from the others; *therefore* these vallies were at some former period connected branches of an extensive æstuary, filled by the waters of the German Ocean, to that height, at which the traces of their residence may still be discerned.

The permanent memorials preserved by nature herself, are the surest and most incontrovertible evidence that can be offered, of her plastic operations and early revolutions. Wherever, for instance, we meet with rocks of lava, we immediately conclude that they were produced by volcanic fires, although those fires may have been extinguished long before the date of human records; and having discovered fossil remains of the enormous mastodon and gigantic elk; we do not hesitate to believe that such prodigies of creation once existed, although their races be now extinct, and the living animals themselves be never known to have met the eye of man. On the same grounds the physical proofs, to which I have appealed, must be received as satisfactory evidence—not of the vague, indefinite theory, that these vallies were once covered by an ancient, universal ocean—but of the more precise and local fact, that they were at some comparatively recent period, arms of that very sea, which now washes our shores, and rolls its swelling tides into all our inlets, æstuaries and bays.

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* Vermes testaceæ. Linnæus.

In farther confirmation of this opinion, I shall now proceed to consider,

2. *The historical proofs of the former residence of the sea in these vallies.*

These may be derived from four distinct sources:

Firstly, from the substance of current traditions;

Secondly, from the remains of antiquity found in the neighbourhood;

Thirdly, from the etymology of the names, by which many of the villages and other portions of this district are still known; and

Fourthly, from positive records, either of the various fortunes of the kingdom of East Anglia, or of the foundation and growth of the borough of Great Yarmouth, or of the changes, which have taken place, during the last eight centuries, in the face of the surrounding country.

Tradition, although no safe authority in matters of detail, is still always founded, in its main points, upon actual facts, and transmits, though often in imperfect and distorted forms, the memory of ancient events or local circumstances. In the present case it has recorded, that the sea once came up to Norwich; and the same saying is equally prevalent, with respect to the castle of Bungay on the Waveney, and other points in some of these vallies. Nor are these merely oral traditions; they have been preserved in a singular document of great antiquity, viz. the map, deposited in the town chest of Yarmouth, and of which a copy is published in Ives' Garianonum. The topographical inaccuracies, not to say absurdities, of this chart are so glaring, that I refer to it for no other purpose than to prove, that, many centuries ago, there prevailed a confused notion, that these vallies were, in earlier times, filled by the waters of the German Ocean. The sketch, by which I have attempted to illustrate this idea more correctly, is not founded upon such authority, but on that of Faden's large map of Norfolk, which was drawn from actual survey, and exhibits, with a minute and valuable precision, every peculiar feature in the aspect of this extensive county. The shaded parts are the marshes, meadows and vallies; the dotted lines, running through them, mark the courses of their present rivers and the beds of the numerous meres or broads, which occupy the deepest hollows; and similar lines point out those portions of the existing coast, which appear to have been the ancient inlets to the waters of the sea. Thus we have an accurate representation of this district, as we may suppose it to have appeared, at that remote period, to which these traditions relate.

We may also trace in it the farther confirmation, which this opinion derives from the accordance between such a view of the former state of these parts, and the situation of the principal remains of antiquity, that still exist in the neighbourhood. In the marshes between Burgh Castle and the opposite rising grounds, "have frequently been discovered parts of anchors, rings and other pieces of iron,"* which were evidently appurtenances of ships, and which indicate the spots, where they were found, to have been permeable to maritime vessels, since the art of navigation has been known to man. But the surest land marks in such an enquiry, are the sites of the Roman forts, which some have ascribed to P. Ostorius Scapula, but most of which I conjecture to have been built, at a later period, for the defence of this very exposed part of the Saxon shore, against the inroads of those formidable northern pirates, by whom it was afterwards so frequently laid waste. The nature of this coast, then broken into numerous islands, and intersected by navigable arms of the sea, penetrating to a considerable distance into the interior of the province, must have offered to invaders a facility of access, which will account both for its having been the scene of so many barbarian incursions, and for the labor bestowed by the Romans upon its defence. Within a comparatively short space, we find the vestiges of three of these frontier posts, which particularly claim our attention; these are, at Caistor, about three miles to the north of Yarmouth—at the well-known ruins, called Burgh Castle—and at another Burgh, a few miles farther to the south, generally distinguished by the appellation of Whitaker Burgh, from the name of the adjoining village.* All these remains are situated on the very edge of the valley, standing immediately on that line of rising ground, which appears to have formed the ancient shore; and in the case of Burgh Castle, where the plan of the fortification may be most distinctly traced, it is remarkable, that only three sides of the enclosure were walled; the fourth, which was left open, being that next to the valley, it is evident that its defence was entrusted to the waves by which it was washed, and to the powerful navy of Rome, which found there a secure harbour.† In any other point of view, it would be difficult to assign a satisfactory reason, that could have induced the Romans to fix a station at Caistor, in the midst of a sandy and unproductive tract, and at a distance from the banks of any river. But, admitting these vallies to have been, at that period, covered by the sea, this becomes at once an important post, overlooking the entrance of a wide æstuary, and commanding its extensive navigation. Spelman considered this to be the ancient Garianonum, which Camden and other antiquaries in his train, have placed at Burgh Castle. The question is far from being satisfactorily decided in favor of either of these parties, and is still involved in so much doubt, that I trust I shall not be deemed too presumptuous, if I venture to offer a new opinion upon a point, on which these high authorities are so completely at variance. Many circumstances have led me to believe, that Whitaker Burgh was the Garianonum of the Romans; and as the facts, from which I have drawn this inference, are calculated to throw considerable light upon the immediate subject of the present enquiry, I shall make no apology for introducing here a brief examination of their most important points.

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* Ives, p. 9.

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* The names and situations of Happisburgh, Smallburgh, and of another Burgh in the hundred of West Flegg, seem to refer all these places to a similar origin.

† Ives, p. 23.

The only information, which we derive from history, respecting this station, is, that it took its name from, and therefore probably stood on, or near, the Garienis, and that the head quarters of the Stablesian horse were fixed there. What then was the Garienis?* Modern nomenclature has confined the name of Yare to the narrow stream, that flows between Norwich and Yarmouth; but this is no proof that the

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* It is not alone the former nature and extent of the Garienis, that have never been decided; even the derivation of the word itself has never yet been satisfactorily traced. Its origin is clearly British; but that it should have been formed from *Guern*, an alder, as our etymologists have supposed, is an idea two puerile to bear serious investigation. The Celtic wave of the great tide of emigration, which, during the infancy of society, set so regularly and powerfully from the east to the west, has left the most evident traces of its course, in the names affixed to many of those imperishable monuments of nature, over which it passed. Hence it arises, that, in countries widely remote from each other, a striking resemblance is frequently observed in the appellations, by which different rivers and mountains are distinguished. Thus the original name of our Norfolk Yare may be found, variously modified, in almost every part of the old world. The Gerus, or, according to Herodotus, the Gerrhus, of Scythia, another river of the same name, which Ptolemy describes as flowing into the Caspian sea; the Geir or Gir, in the interior of Africa; the Garonne, anciently the Garumna, of France; the Yarrow, of Scotland, and several others, all appear to have

so close an affinity, that it is difficult to suppose them not to have expressed originally the same idea. The most probable origin of the name, as applicable to rivers, seems to be presented by the Celtic, *Garo*, or *Garu*, (written in Welch *Garrw*, in the Gaelic, *Garbh*, and in the Armoric dialect, *Geruin)*, which signifies *rough*, and from which was also derived, in the same language, *Garuvor*, a storm. In the Gaelic, *Garbh-shion* is a rough blast; *Garbh-uaic*, a storm; and *Garbh-thonn*, a breaker, or rough wave. Bochart, in his Geographia Sacra, p. 757, refers to many words in the Hebrew, Phenician, and Arabic tongues, which are similar to these, and are used to describe the force of rapid or agitated waters; and he particularly instances the passage in the Song of Deborah, (Judges v. 21), "The river of Kishon *swept them away*," where *gerapham* is the Hebrew verb employed. Admitting this explanation, the names of all these rivers denote a rough, or turbulent stream. To the Garonne this character is proverbially appropriate; to the Yarrow it is also applicable; and although our modern Yare can scarcely be placed in the same class, still from the evidence afforded by that extensive tract, which the Garienis appears formerly to have occupied, the name may have been bestowed, with good reason, upon the wide and stormy æstuary of those earlier days. The description of the ancient Garumna, given by Mela Pomponius, in the second chapter of his third book, not only justifies this interpretation of its name, but also exhibits so true a picture of what the Garienis seems to have been, that I cannot refrain from quoting the passage:—"Ubi obvius Oceani exæstuantibus accessibus adauctus est, iisdemque retro remeantibus suas illiusque aquas agit, aliquantum plenior, et quantò magis procedit, eò latior fit; ad postremum magni freti similis: nec majora tantum navigia tolerat, verum etiam more pelagi sævientis exurgens, jactat navigantes atrociter, utique si aliò ventus, aliò unda præcipitat." It is singular that Camden, who suggested this derivation of the Garumna, should not have thought that the Garienis might also be traced to the same root. There is a remarkable similarity between the names of the two rivers, as given by Ptolemy, the Garienis being γαῤῥύένος (Garruenos), and the Garumna, γαρύνα (Garuna); Strabo calls the latter γαρουνᾶ (Garouna); and as each of the districts watered by them is original name was not more extensively applied.* In the course of the changes which this district has undergone, it was natural, that the principal stream should retain the ancient appellation of the whole æstuary, and that the other branches should be distinguished by new names. In those names we find

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known to have been peopled by a Celtic tribe, we may infer that both words belong to one language, and convey the same meaning. *Garu-an;* (Welsh, *Garrẁ-avon;* Gaelic, *Garbh-amhainn*)*;* i. e. the rough river, would easily take the Hellenized form, in which it is presented to us in both these cases; and I surely neither assume an unreasonable licence, nor strain too far the application of etymology, if I consider this as a collateral proof of the fact, that the Garienis offered, to the first settlers on its shores, the aspect of a wide and agitated body of water. Ptolemy, in whose geography the earliest mention of the Garienis occurs, certainly designates it, not as an æstuary (ἐίσχυσις), but as a river—γαῤῥυενου ποτ. εκβολαί. But he applies the very same terms—ἄβου ποτ. εκβολαί—to the Humber, which even now may be considered as an arm of the sea; and the fact of his having noticed the Garienis proves, that, in his time, it must have occupied a much more conspicuous portion of our coast, than it does at present. Between the Humber and the Thames, except the now uncertain promontory which he names ἐξοχή, he enumerates only three important points, the æstuary of the Wash (μεταρὶς ἔισχυσις), the Garienis, and the present Blackwater river in Essex. We may thus infer the then character of the Garienis, both from the general nature of the class in which it is placed, and from the omission of many rivers, whose havens at this time are much more capacious than that of the Yare.

* The river at Norwich is unquestionably the Wensum; where it properly becomes the Yare is even still doubtful. Some have supposed that the Yare is formed by the confluence of the three rivers at Yarmouth, as the Trent takes the name of Humber, when joined by the Ouse and its tributary streams. It appears from an old document preserved by Parkins, in his continuation of Blomfield's History (Vol. 7, p. 241), that the small brook which descends from Plumstead and joins the main river near Brundall, was formerly called the Ger.

no traces of a Latin origin;[*] nor have the Roman historians and geographers designated in any other manner any of the various channels, which certainly existed in their days. We may therefore conclude, that the term Garienis was common to all the different openings, by which this large inlet was connected with the waters of the ocean, as the Nile, the Danube and the Ganges, generally preserve their respective names in the separate channels, through which they flow into the sea. In our most ancient maps, that portion of Suffolk, which is now the hundred of Lothingland, is represented as an island in the entrance of the river Yare, dividing it into two streams, one of which discharged itself at the present haven of Yarmouth, and the other at Kirkley road, near Lowestoff. To the Roman fleets, coming from the south, the latter of these openings must have offered the most direct passage to their establishments in the interior of the country.[†] The great depth of water still remaining in the lakes, which occupy nearly the whole of this branch of the vallies, bears testimony to the former excellence of the navigation, while the channel, being more contracted and sheltered,* was in every point of view, a safer and more accessible harbour, than they could possibly find in their circuitous course amidst the shoals and sand-banks of the wider northern entrance.† Fronting this southern mouth of the Garienis—on the projecting point of the rising grounds which divide the vallies of the Yare and Waveney—is situated Whitaker Burgh, to which ancient tradition has assigned a Roman origin. It is impossible to look at the map, without being convinced, at a single glance, of the commanding nature of this post; but to visit the spot itself, and survey from its bold eminences the wide panoramic view of the surrounding vallies, will give the clearest idea of the importance of such a station, at the period when those vallies were covered with navigable floods. Throughout the whole extensive range of the broken shores of the Garienis, there was not a point, which, to foreign rulers, like the Romans, could secure for their fleets so easy an admittance, and present such direct means of communicating, either by land or water, with their inland forts and remoter colonies.

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[*] The *Waveney* is decidedly of Saxon etymology. The *Bure* is apparently derived from the same source, being supposed to take its name from Burgh by Brampton, which stands on its banks.

[†] In the same manner, it is agreed by all our antiquaries, that the Roman navigators, instead of sailing round the North Foreland, entered the Thames through the now blocked up streight, which extended from Rutupiæ (Richborough) to Regulbium (Reculver), and which separated the isle of Thanet from the main land of Kent. It is remarkable that part of this ancient channel, now a small stream running into the Stour, should have the same name as the river at Norwich, being called the Wentsum.

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* See Mr. Cubitt's account of Lake Lothing and Oulton Broad, in the Minutes of Evidence taken before the Committee on the Norwich and Lowestoft Navigation Bill, p. 8 and 9.

† "*Incertus volvens Garienus arenas,*" which was the description given of our river two hundred years ago by Pontanus, would have been equally just fourteen centuries earlier, if we may credit the evidence of the sandy tract that now surrounds Yarmouth. Nor is it less applicable in these days, when the navigation is so often impeded by the shifting sands, that accumulate at the mouth of the present haven.

As far then as respects the name of Garianonum, the pretensions of this station are at least equal to those of either of its rival claimants. It certainly contains no positive traces of any Roman works; but coins have been found there; a few Roman bricks may also be seen in the wall of the church; and these, together with its present name, afford evidence as conclusive as that, on which the site of a Roman station has been fixed at Caistor, where all remains of ancient fortifications are equally obliterated.* Spelman, Junius, and all our glossarists agree, that Burgum, Burgh, or Borough, denoted originally a fortified place, "*castrum, vallum, sepimentum ve militare*;" wherever it occurs in the names of English towns, whether singly or in composition, it is almost as certain an indication of a Roman work, as either Caistor or Chester, and there are very few instances, in which such places have not produced positive relics of the first conquerors of Britain.

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* There is an extensive area round the present church at Whitaker Burgh, projecting into the low meadow lands, by which it is surrounded on the north, east, and south. On the western side it seems to have been cut off from the higher grounds by an artificial trench, across which the communication appears to have been restored by a narrow isthmus, connecting this peninsula with the main land. The ridge formed by this trench seems to have been continued at right angles along the northern and southern sides of the area. The whole enclosure certainly bears a striking resemblance to the form of those Roman towns, whose outlines may still be traced in this country. Near the centre of this area, and at a short distance from the west end of the church, are the ruins of an old chapel, which must have been of early importance, as it is said to have exempted the lands of the whole parish from the payment of tithes. These ruins occupy a small mound, the situation of which, with reference to the rest of the area, is precisely that, where the prætorium would have been placed in a Roman camp.

Richborough, in Kent, is the *Rutupiæ* of Ptolemy.

Marlborough, in Wiltshire, is the ancient *Cunetio.*

Aldborough, in Yorkshire, the *Isurium Brigantum.*

Borough, in Westmoreland, the ancient *Verteræ.*

Borough-hill, in Leicestershire, formerly *Vernemetum.*

Littleborough, on the Trent, the ancient *Segelocum.*

Ellenborough, in Cumberland, formerly *Volantium.*

Overborough, in Lancashire, anciently *Bremetonacæ.*

Tasburgh, in Norfolk, was the station *Ad Taum.*

At Blithburgh, in Suffolk, Roman urns have been discovered, and at Burgh Castle, which has been already mentioned, as also at Attleborough, at Burgh Apton, and at Burgh, near Brampton, which are all in this district, the remains are of such a nature, as indisputably to prove the former residence of that people.* Numerous instances of the same kind may be found in almost every county of England. The only difference between Caistor and Burgh is, that the one is of Latin, and the other of Saxon derivation; the latter was most probably adopted, where the ancient possessors were altogether expelled by the new settlers, and all traces of their language obliterated, while the former was preserved in those places, where the original inhabitants were permitted to remain.

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* It may also be observed that the piece of ground, on which the Roman coins have been found at Caistor, near Yarmouth, is called the East Bloody Burgh Furlong. Sir Thos. Browne's Hydrotaphia, p. 5.

There is, however, still another fact, which appears so decisive, as to leave no room for farther doubt upon this question. Among the chemini minores, or vicinal roads, of the Romans, we find the remains of one called the Portway, between Raveningham and Hadscoe.* It is well known that these vicinal ways were branches, leading from the principal military roads, to the neighbouring stations, and that it was the general practice of the Romans, in such cases, to proceed as nearly as possible in a straight line. Pursuing then such a line from Hadscoe through Raveningham, towards the nearest main road, it brings us first to Burgh Apton,† which is at nearly an equal distance from Tasburgh, the station Ad Taum, and Caistor by Norwich, generally supposed to have been the Venta Icenorum. Both these places are situated on the Roman highway, which connected Burgh by Brampton with the southern provinces, and from which it is known that a vicinal road, called Stone Street, branched off at Tasburgh, leading to Blithburgh, a Roman maritime station in Suffolk. Vestiges of this road are found in the village of Hempnall; and in the maps of Suffolk the ancient name is still given to the road from Bungay to Halesworth and Blithburgh. Finding then between this military way and a point of the adjacent coast, a portion of another line of communication, bearing the decisive name of the Portway, *Portûs Via*, or Harbour Road, we must of necessity conclude that it is part of a road, which extended either from Caistor or Tasburgh (most probably from the former), to some important naval establishment. It is not likely that it terminated at Hadscoe; but by extending the same straight line about three miles more to the eastward, it leads directly to Whitaker Burgh, which is thus indicated to have been the port of the district, and considered of such importance, as to be immediately connected, by a regular road, with the Venta, or capital of the whole surrounding province.

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* Gough's Introduction to his edition of Camden's Britannia, p. 75.

† The Roman antiquities discovered in the neighbourhood of this place, shew that it was of considerable importance; and Spelman, in his Icenia, even hints that it may have been the *Venta Icenorum*.—Reliquiæ Spelman. p. 156. "Decurrit hinc fluviolus ad Romanam alteram munitionem, sed an Ventam illam Icenorum, quâ nihil olim apud nos illustrius, ego subito non definiam." The *fluviolus* here mentioned is the small stream which meets the Yare at Hardley, nearly opposite to Reedham. To those who may deem my reasons for fixing Garianonum at Whitaker Burgh not sufficiently conclusive, I would suggest, as the next most probable idea, that of placing it at Burgh Apton. This site is sufficiently connected with the Garienis to have taken its name from it, and in that case Whitaker Burgh may have been its harbour. Whoever observes attentively the features of this district, and the bearings of the different Roman stations, will be convinced, that Garianonum must have stood in some part of the uplands between the vallies of the Yare and the Waveney.

This fact, then, coincides with and corroborates, in a most striking manner, the other circumstances, which evince, that these vallies were at that period branches of a navigable arm of the sea; in which case, those portions of the coast, where Caistor and Burgh Castle are situated, must have been islands, of no great extent, and separated from each other, as well as from the main land, by wide and formidable channels. It is highly improbable, that a people so practised in military affairs as the Romans were, should have fixed the head quarters of a body of cavalry in either of these situations, where they must necessarily have been cut off from the rest of the country, and confined to a very limited sphere of action. Indeed both seem to have been harbours, where fleets were maintained, for the purpose of guarding the shores against the incursions of maritime foes; and they were probably out-ports or dependencies, garrisoned by detachments from the nearest main stations. Burgh Castle was perhaps under the immediate command of the officer fixed at Garianonum; while Caistor, the neighbouring Burgh in West Flegg, Happisburgh, and Smallburgh, may be considered as appendages to the superior post at Burgh by Brampton. If it be permitted to hazard a conjecture, where the data afforded by history are so very scanty, I should place the æra of their foundation during the latter years of the Roman sway in Britain. Claudian is the only writer who throws any light upon the subject; while celebrating the praises of his patron, Stilicho, he expressly ascribes to him the merit of having fortified the coasts of our island against the invasions of the Saxons.* The passage has been so often quoted, that it is not necessary to repeat it here; but the phrases *munivit*, *littore tuto*, and *dubiis venturum Saxona ventis*, imply clearly the nature of the security, and the description of enemy against whom it was afforded; they can only refer to the erection of new forts on those parts of the coast, which were most exposed to the attacks of the Saxons.* The military command of Stilicho in these parts preceded his Consulship in the year 400; as the situations of the works at Caistor by Yarmouth, and at Burgh Castle, are so evidently adapted to the purpose, which he is said to have accomplished, it cannot be very unreasonable to suppose, that they were erected by his orders towards the close of the fourth century, and about fifty years before the Roman legions finally relinquished the occupation of our island. The walls of Burgh Castle are among the most perfect specimens of Roman building in this country, and the coins found there are principally those of the latest emperors.†

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* De Primo Cons. Stil. ii. 250.

The situation of Whitaker Burgh, on the contrary, independently of its advantages as a maritime station, marks it as one of those spots, where a conqueror would concentrate his forces, in order to secure the allegiance of a newly subdued country. Surrounded by a fertile arable tract, which the Saxons soon afterwards designated as the wheat-acre—the farm or granary of the province—it was also placed between the two principal branches of the Garienis, and had an uninterrupted communication with all the inland districts, and the most important garrisons by which they were occupied. The commander of this post could send detachments to patrol the neighbouring shores or to guard the adjacent islands, and his forces would be equally ready for immediate action, either on the sudden emergencies of land warfare, or the service of maritime expeditions. At such a point the head quarters of the Stablesian horse may be supposed to have been fixed, without being liable to the objections that have been urged in the two other instances; and here, therefore, I venture to place the situation of the ancient Garianonum, upon the authority of presumptive evidence far more conclusive than I can any where find to have been advanced in support of the contrary opinions. Nor is this a mere dry question of antiquarian speculative research; historical enquiry is here the hand-maid of philosophical truth. The relics of long dominion, which the departed conquerors of the world have left in this neighbourhood, afford additional confirmation of a fact already indicated by natural phænomena; they assist to prove, that fourteen centuries ago, the eastern vallies of Norfolk were still covered by the waters of the ocean—a circumstance, from which such important geological results may be deduced, that I am anxious to establish it by all the collateral and concurrent testimony, that I have been able to collect.

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* Higden's Polychronicon (book, 4, chap. 32) reciting, after Gildas, the latest works of the Romans in Britain, says, that, besides repairing the wall of Severus, they "buylded toures on the clyues of the occean in dyverse places, where as men dredde the arryuyng & londyng of straunge men & enemyes." Richard of Cirencester is still more precise. In his Commentarioli Geographici de Situ Britanniæ (lib. 2, cap. 1, p. 77) he points out the date, the situation, and the founder of these works. "A. M. 4400. In littore meridiano maris, quia et inde hostis Saxonicus timebatur, turres per intervalla ad prospectum maris statuunt. Id Stilichontis erat opus." We know from the Notitia Imperii that the whole coast of Norfolk was included within the command of the Count of the Saxon shore. The term "*in littore meridiano*" is applied to this district, in reference to the more northerly site of the wall of Severus.

† Ives, p. 30.

The next period in our history is the Saxon æra; and in the etymology of the names given by that people to many parts of this district, we shall perceive further proofs of the state in which they found it on their arrival. I have already observed, that the wide part of the valley of the Bure, as it approaches towards the sea, is "interspersed with many insulated plots of rising ground, still called *Holms*." This is so universally known to be an Anglo-Saxon term, signifying *Islands*, that it would be superfluous to cite any authorities upon the subject; and it is almost equally unnecessary to remark, that at the time when these parcels of land were so denominated, the surrounding lowlands must have been covered with water. In the valley of the Waveney, between Beccles and Bungay, there is also a similar knoll, on which the church and part of the parish of Ellingham are situated, and which is still called the *island*. The original name of this village seems to have been Eȝelinȝham, the dwelling on the little island, from eȝe, an island, linȝ, the diminutive, and ham, a dwelling or home. On the northern side of Yarmouth there is a considerable tract, now divided into the two hundreds of East and West *Flegg*. This again is an Anglo-Saxon term of the same import as our modern English word *Flat*, the German *Flæche*, (with which it nearly agrees in sound) and the Dutch *Vlakte*.*

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* I must acknowledge that none of our glossarists have preserved the word; but this is no proof that it did not exist. No glossary either does, or can, pretend to comprize all the words

The name is by no means descriptive of the present appearance of this district; but when the adjacent vallies were overspread by navigable floods, it was perfectly appropriate, and would naturally suggest itself, as in later times, the appellation of Borough *Flats* has been given to the level marshland near the junction of the Waveney with the Yare.* It is remarkable that the names of nearly all the villages in the Flegg hundreds terminate in *by*. Spelman, Camden, and Gibson believed them to be of Danish origin, on the ground that *by* in that language signifies a dwelling. I am by no means satisfied with this interpretation; for not only does it give no rational explanation of some of these particular names, but, even supposing the places in question to have been

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currently used by the Anglo-Saxons; it only professes to explain the meaning of all those which occur in the few writers, whose works in that language are still extant. It must therefore have happened, that many of its terms have not been recorded, and can now only be traced by comparing our modern English with its cognate dialects. Finding then in three languages, which are admitted to have flowed from the same source, the three words *Flat*, *Vlakte*, *and Flæche*, all synonymous, they must have been derived from one common root. But modern English is connected with German and Dutch only through the medium of Anglo-Saxon, which must therefore have contained a word nearly similar to its derivative in import and sound. Traces of such a word may be found even in the glossaries, for ꝼlacȝe, a plaister, and ꝼlacea, a flake, must have been formed from some word, presenting the general idea of flatness.

* Our inland navigators seem to have appropriated the term *Borough Flats* to that portion of Breydon which is opposite to Burgh Castle; but, if there be any meaning in the word, it must belong to the *flat* or level tract on the shores of the lake, and at the foot of the rising grounds on which the old Roman fortress stands.

peopled by colonies of that roving nation, still we find, in all the neighbouring district, that the settlements of strangers (some of them probably of the Danes themselves) are not distinguished by the terms of a foreign language, but denominated *Walsham*, (Ƿealhſham—*peregrini habitatio*) and *Framlingham* (Fremdlingſham—*exteri habitatio*) in the vernacular idiom of the earlier occupants. The term *by* is not, however, exclusively Danish, being equally as much Anglo-Saxon; and although in some cases it may be used to signify a dwelling, still, from various circumstances, I am disposed to think, that most frequently, and especially in the instance now before us, it is derived from the Anglo-Saxon Bẏȝe, which, according to Somner, denotes "*Angulus, Sinus, a bosome* or *bay*." Hence was derived the now almost obsolete word *Bight*, of which Skinner, in his Etymologicon Linguæ Anglicanæ, gives the following account. *Bight*, Vox nautica, Inflexio vel Flexura, ab. A. S. bẏȝan, flectere.

It was therefore synonymous with, and undoubtedly the original root of our modern word *bay*, corresponding with the German *bucht*, and Dutch *bogt*; and in this sense *bight* is still in use with the boatmen of Norfolk, to describe the coves or bays of our inland waters. Such sheltered recesses would naturally be the first places of abode, selected by maritime adventurers, like the Saxons; hence it appears to me highly probable, that the terms, bẏe, *a dwelling*, and bẏan, *to dwell*, are themselves derived from bẏȝe, *a bay*. They contain no primitive idea—they express nothing of themselves—nor can they be traced back to any form of thought, more intelligible than that which I have suggested. The opinion which I have thus hazarded, seems also to derive greater consistency from the fact, that, though both in German and Dutch there are words of the same derivation and import as byȝe, yet neither language contains a term corresponding with bye, to convey the signification of a dwelling.* The rising grounds of the Flegg hundreds are remarkably indented by the contiguous vallies, particularly by that, which now contains the Filby and Rollesby broads, and which, penetrating almost to the sea, formed the ancient division of the eastern and western flats. These bendings must of course have formed bays, when all the low grounds were covered with water, and each of the villages, to which I have referred, stands either upon, or in the immediate neighbourhood of, one of these former *bights*. This etymology assigns to Herringby, for instance, an intelligible meaning, while the other construction of its last syllable, would give it, at best, a forced, obscure and far-fetched signification. Indeed the name of this place, and that of Herringfleet, on the opposite skirt of the valley (both being derived from a fish, for which the adjacent seas are still celebrated, while the places themselves are from four to five miles distant from the present coast) can only be accounted for, by supposing these vallies to have been, in ancient times, an arm of the sea, and in that state to have been annually visited by the shoals of herrings, as the lochs and deep bays of Scotland are at the present time.* In no other way could the inhabitants have applied to either of these villages the terms of Herring-bay or Herring-fleet (i.e. flowing or stream), and these names being of Anglo-Saxon origin, indicate very plainly the state of this district, at the period when it was possessed by that people.

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* That this etymology of the final syllable *by*, should have been overlooked by our Saxon students, is somewhat strange, particularly as there is an instance, which seems calculated to have forced it upon their attention. The ancient name of Whitby, on the coast of Yorkshire, was Streneshald. Bede (Hist. Eccles. lib. 3, cap. 25,) interprets this *Sinus Fari*. Somner calls it Ꞅꞇꞃeonꞅheale, *Littoris Angulus*; à ꞅꞇꞃeonꝺ, *littus*, et heal, *angulus*. Charlton in his history of Whitby, and Bishop Gibson and Mr. Ingram in their respective editions of the Chronicon Saxicum, either recite or follow these authorities. Here then we have an ancient name, which evidently denotes *a bay*, altered into a more modern name, ending in *by*. Mr. Young, in his history of this place (vol. 1, p. 240) asserts that *by* signifies a *village*, and, in a note, ridicules Charlton's explanation of it. Yet he adduces no proofs in support of his own opinion, and renders his information upon the subject very doubtful, by the floundering attempts which he makes to explain the meaning of Bede's *Sinus Fari*. By the words "quod interpretatur," Bede evidently implies that this is a Latin translation of the Saxon name Streneshald; and if Mr. Young had referred to Dufresne (vol. 3, p. 347) he would have found that *Farus* signifies *Fretum*, which renders the sense of the phrase obvious. The French at present call the Streights of Messina, *le Phare de Messine*. Saussure, in his Voyage dans les Alpes, says, "J'ai vu au bord de la mer sur le Phare de Messine," &c. which Mr. Granville Penn, in his Comparative Estimate, (Supplement, pp. 4 & 5) translates, "I saw on the *border* of the sea, *near the light-house* of Messina." This is not the only instance in which the champion of the "Mosaical Geology," has shewn, that he does not understand what he professes to explain and ventures to criticise. Bede's *Sinus Fari* has, however, been a stumbling-block to most of our historians. Dr. Henry was led, by his

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erroneous view of its meaning, to give the mis-translation of *Streneshuld*, which occurs in the appendix to the second volume of his history, where he says that it signifies *Beacon Bay*.

* Travels of Faujas St. Fond, vol. 2, p. 116.

The termination of *by* occurs in the names of several other parishes in this part of Norfolk, and the adjoining borders of Suffolk; but, in every instance, these places stand, not merely upon the verge of some one of these vallies, but also upon one of those bendings, which must have formed an ancient *bight*. This may be seen at Ashby and Barnby,* on the Suffolk, and at Aldeby and Kirby Cane, on the Norfolk, side of the valley of the Waveney, as also at another Ashby on that of the Yare; and there is another instance of it in the neighbourhood of Norwich, at Kirby Bedon, situated as I have before observed, upon a narrow dell, that runs up from the main valley, and not only shews the outline of a sheltered cove, but presents also the remains of marine shells.

Among the towns and villages of Lincolnshire, the proportion of those, which are distinguished by the final syllable *by*, is remarkably large; and the nature of their situation coincides precisely with that of the villages of the Flegg hundreds. They are, for the most part, planted on the verge of those extensive fens, over which, even within the memory of the present inhabitants, the sea has frequently re-asserted its ancient dominion; and others stand on the sides of vallies, that descend either to these lowland districts, or to the æstuary of the Humber, or to the ocean itself. In almost all these situations may be found the traces either of marine or of inland waters, forming, at an earlier period, numerous bays or bights; and a frequent repetition occurs of the very same names that we meet with in Norfolk, such as Ormesby, Maltby, Kirby, Ashby, Barnaby, &c. This similarity of names, at different points, under local circumstances so strikingly similar, is an evident proof of the connection which I have pointed out; and confirms the idea, that the earliest Saxon colonists, having each selected a convenient bẏȝe, near which he fixed his habitation, the word became by degrees synonymous with *dwelling*, and was the origin of the term bẏe, which in that sense forms the termination of the names of some inland towns.

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* It is worthy of remark, that the adjoining village to Barnby is called North Cove, so distinguished from South Cove, another village on the sea coast near Easton. Cove is derived from the Anglo-Saxon Coꝼa or Coꝼe, the primary signification of which was *any covered place*; thence it was used to denote *a cave*, *an interior room*, and finally, *a sheltered bay*, in which sense it now prevails. South Cove is situated on the skirts of a small deep glen, which penetrates to a short distance inland from the shore, and has every appearance of having been anciently such a bay as its name describes. North Cove stands on the edge of a similar dell, descending to the valley of the Waveney.

It should also be observed that this termination is frequent in the names of places in the province of Schleswig, which is the very part of the Cimbric Chersonesus, from which our Saxon ancestors, and especially the colonists of East Anglia, are believed to have emigrated. But these places almost invariably stand, either like Kolby and Resby, upon a coast which is full of bendings, or, like Haddeby,* on some of those beautifully winding arms of the sea, which penetrate into, and adorn, the inland parts of that district. The same remark will apply to Jutland, the

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* Ethelwerd, as quoted in Turner's History of the Anglo-Saxons, (vol. 1. p. 186,) gives to this ancient capital of the Angles the name of Haithabay.

Danish Isles, and Sweden, in all which countries numerous instances present themselves of towns and villages, whose names end in *by*, and which are situated, almost uniformly, upon the broken shores of the Baltic, the Skaggerac, and the North Sea, or upon the sinuous banks of extensive lakes. In Norway, however, which may be supposed to have sent forth from its countless harbours, many of those lawless buccaneers, who, under the name of Danes, infested our island during so many centuries of rapine and murder, the final syllables most commonly found in the Index Villaris, are *fiord*, *sund*, and *dal*. The former of these denotes a deeply indented bay,* and they have all an evident reference to those local circumstances, which must naturally suggest the appellations, employed to distinguish particular spots in early and artless ages. Of this character also is the interpretation that I have offered of the final *by*, in the designations of our East-Anglian villages. It appears to be universally applicable in that sense, throughout all the countries where it occurs; and if adopted in that quarter, where our enquiries began, it will be found to reconcile many apparent contradictions, while it concurs with a long train of circumstantial evidence to support that fact, which it is the more immediate object of this essay to prove.

Lothingland, the name of that portion of Suffolk, which is insulated by the vallies of the Waveney and the Yare on the south, west and north, and by the sea on the east, was supposed by Hollinshed† to be a contraction of Little England; and that the tract was so called by the Saxon navigators from its resemblance to the main island of which it was an appendage. The neighbouring hundred of Loddon, in Norfolk, being termed in the Domesday book, Lothinga, Lothninga, or Lotninga,* the similarity of the names, in the relative positions of these two districts, appears to require a common derivation, which, whatever it may be, cannot support Hollinshed's opinion; and I have only noticed it on account of its indicating such local characteristics, as could alone have given rise to this idea. It is not necessary to appeal to a doubtful etymology in order to prove that Lothingland was an insular tract in the Saxon times, for the most unquestionable evidence can be adduced of this fact, and even to the present day, *the island* is the term, by which it is generally known among the people of the neighbouring country.

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* Von Buch's Travels in Norway, p. 22.

† Chronicles, vol. 1. p. 44.

It has been generally asserted by later writers, that Cerdic, the Saxon, landed in 495, on the ground where the town of Yarmouth now stands, and that he gave it the name of Cerdic sand or Cerdic shore. Being convinced that this part of our coast was not then in existence, I have endeavoured to trace the origin of this opinion, and can find no authority for it in our most ancient documents. It is astonishing to observe on what slight grounds it was first adopted, and with what little examination it has since been received and repeated. Cerdic is acknowledged to have been the founder of the kingdom of Wessex, which fact is reconciled to the above-mentioned statement by the gratuitous assertion, that he abandoned his first acquired territory on the eastern coast, and betaking himself to his ships again, sailed to the westward. This, however, is directly opposed to the testimony of the Saxon Chronicle, which narrates this event in the following words: "A. D. 495. This year came two leaders into Britain, Cerdic and Cynric his son, with five ships, at a place called Cerdic's ore. And they fought with the Welsh the same day."* (ilcan ꝺæᵹe.) From this it is evident, that, immediately on his landing, the struggle commenced, which is subsequently described, without any change of scene being mentioned. But it will also be seen (at p. 21 of the same record) that this Cerdic's ore was the regular landing place used by the West Saxons, and that the reinforcements, which three ships brought them nineteen years afterwards (A. D. 514), were disembarked there;† hence it is evident that this could not have been any part of the eastern coast, but must be sought for on the south-western shores of England.

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* The Saxon Chronicle (Ingram's edition, p. 218) mentions two Danish chiefs, Lothen and Irling, who, in 1047, with five ships attacked the eastern coasts of England. May not both Loddon and Lothingland owe their names to the former of these leaders? In Domesday book, Lowestoff is called Lothen Wistof.

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* Ingram's Edition, p. 17.

† Matthew of Westminster, in his account of this event, states distinctly that it took place in the western part of Britain. His words are, (p. 96) "Anno Gratiæ 514 venerunt Nepotes Cerdici, Scupha et Wihgarus, cum duabus navibus in Britanniam, et applicuerunt in Occidentali parte Britanniæ."

The earliest authority that I can find for placing Cerdic's ore at Yarmouth, is Robert of Gloucester, whose Chronicle is supposed to have been written about the year 1270, and in which the following account is given of Cerdic's landing.

> " Hẏt was eẏȝte and fyfty[*] ȝer after Hengyste's kynedom
> " Ar enẏ kẏng of Saxons in Westsex com.
> " Vor Hengẏst was kẏng fourtẏ ȝer, and in þe eyȝte ȝere
> " After ẏs deþ at ȝernemouthe arẏved þer were
> " Vẏf ssypuol of Saxons, ẏ armed wel ẏ nou,
> " Certẏk het her cheuenteẏn þat to þẏs lond hem drou."[†]

Gibson, in his Index to the Chronicon Saxicum, extracts the following passage from Brompton, who wrote about the year 1330; " Sardiceshore, quæ nunc vocatur Gernemuth." Higden, whose Polychronicon was compiled about forty years afterwards, and Trevisa's version of which was corrected and published by Caxton, in 1460, narrates the same event thus: (p. 187) " That yere ii Dukes of Saxons, Cerdicus and his sone Kynricus, with fyve shyppes cam a londe at Cerdyshore, that now is called Yarnemouth."[‡] As the most ancient of these writers did not live till nearly eight hundred years after this event, their statement must of course rest upon the authority of some older historian, who, while evidently copying from the Saxon Chronicle, added his own comment upon the name of the place mentioned. It is clear however that no data are afforded in any one of these instances, by which we can possibly identify the Gernemuth or Yarnemouth here referred to, except as far as Robert of Gloucester distinctly states, that Cerdic's landing there was *the first coming of the Saxons into Wessex;* from which we may infer that the place so designated, was considered to be a part of that kingdom. I can find no decided reference to our Norfolk Yarmouth till the year 1504, when Fabian wrote his Chronicle, which contains the following account: (p. 93) "Cerdicus, whiche of some authours is named Childricus, landed first at Cerdishore, whiche nowe is called Yeremouth, an haven towne in the countrey of Norff: And by help of other Saxons then inhabited in that countrei, then called East Anglis, the saide Cerdicus at length obteyned the foresayde countrey, and named it West Saxons." Fabian generally appeals to Higden's Polychronicon as the source of his information; but in this case he has added, apparently on no authority but his own, circumstances which depart so widely from the truth of history, as to throw great discredit upon his own unsupported testimony. He places the arrival of Cerdic in the year 522 instead of 495; he represents him as having landed amidst a friendly and allied people, although the Saxon Chronicle expressly declares, that he encountered the hostile Britons as soon as he set foot on shore; and so far from the East Angles having assisted him in his conquests, their own kingdom was not finally established till the year 575, when Cerdic had been dead 41 years. These unsubstantiated assertions and glaring inaccuracies afford us just grounds for suspecting, that Fabian's inference with respect to the locality of the Gernemuth of preceding historians, was merely an opinion of his own, hastily adopted without consideration or enquiry; yet for three centuries it has currently prevailed, scarcely contradicted and little doubted.* Camden assented to it, but quotes no authority; Spelman does the same, for his reference to Ethelwerd is only to prove that the place where Cerdic landed was called Cerdicshore; and Gibson, following them, concurs in the idea, that the situation so pointed out must be—"Ostium Garienis, unde hodie Yarmouth in agro Norfolciensi." There have not, however, been wanting those, who have seen the inconsistency of such an opinion. The diligent researches of the acute Carte† led him to suggest that the real Cerdic's ore might perhaps be found at Charmouth, a village at the mouth of a small river on the coast of Dorsetshire; and Gough, in his additions to Camden,‡ admits both the difficulties of the case, and the probability of this solution of them. Dr. Henry§ also places Cerdic's ore at Charmouth, and in the same page fixes Carrum there likewise, but without assigning his reasons in either case, or affording any explanation of this seeming contradiction. Whitaker[*] and Turner[†] have both expressed their doubts upon this point; but the latter attaches too much weight to Camden's assertion, that the neighbourhood of Yarmouth was called by the inhabitants Cerdicsand. There is no other record of such a name, nor has it ever been currently adopted. As Fabian's Chronicle had been published about 100 years when Camden wrote, some readers of that work had probably attempted to give the district an appellation, by which it was never generally known. Lingard, convinced of the fallacy of the prevailing idea, says in a note [‡] that the Yarmouth mentioned by Higden is probably the town of that name in the Isle of Wight. But that island was not conquered by Cerdic till the year 530;[§] nor would forces, destined to act in the Western counties of England, have used that as a landing place, from which they must have been reshipped in order to arrive at the scene of action. The opposite coast of Hampshire might possibly have been the place, and some antiquaries have therefore fixed Cer-

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[*] Query, fourty ?

[†] Hearne's Works, vol. 1, page 227.

[‡] Gale, p. 224, refers to this passage as his authority for adopting the prevailing opinion.

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* Hollinshed (p. 87) quotes Fabian as his authority for making Yarmouth, in Norfolk, the scene of Cerdic's first descent on the shores of Britain. In order to reconcile this view of the subject with subsequent events, he says (p. 89) that the landing of Stuffa and Whitgar took place, not at *Cerdic's ore* but at *Cerdic's ford*, or Charford, which is in direct opposition to all historical evidence, and contradicted by the inland situation of the latter place.

† See his History, vol. 1, p. 199.—Note.

‡ Britannia, vol. 1, p. 126.

§ See the list of the Saxon and present names of different places, in the appendix to the second volume of his history. In the course of the researches to which this enquiry has led me, I have seen enough to be convinced, that our antiquarian topography is the most imperfect department of our literature. There is no other science, in which we have so much confusion,

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or so many gross errors, quietly prevailing, under sanction of the authority of great names. Even Carte was unable to extricate himself entirely from its mazes. He confounds Cerdic's ore with Cerdic's ford, and afterwards falls into the general mistake of considering *Carrum* to be the same place.

[*] History of Manchester, 4to. edition, vol. 2, p. 61.

[†] History of the Anglo Saxons, vol. 1, p. 172.

[‡] History of England, 4to. edition, vol. 1, p. 71.

[§] Ingram, p. 22.

dic's ore on the western bank of Southampton water, for which the only reason that can be assigned is, that it is more likely to have been the spot than the mouth of our Norfolk Yare.

I am entirely, however, of Carte's opinion, that Charmouth is the place. This point opens a direct entrance into the ancient kingdom of Wessex; and the present appearance of its enclosed valley indicates, that it was formerly one of those small, sheltered gulphs, which offer the most secure and convenient harbours.* In Domesday Book it is called Cernemude; and in old maps Caꞃꞃanmuþa; the C (C) and Ᵹ (G) of the Anglo Saxon alphabet bear so close a resemblance to each other, and the state of our language, both as to pronunciation and orthography, was so unsettled between the sixth and fourteenth centuries, that, whether in transcribing an earlier manuscript, or in enditing from oral testimony, no mistake would be more likely to occur, than the substitution of Gernemuth for Cernemuth; and the error, once committed, would easily be perpetuated, at a time when the former place was rising into celebrity and the latter was sinking into oblivion. That Charmouth was the landing place of Cerdic appears also the more probable, from its resemblance to the present names of other villages, which are known to have been denominated after him. Ceꞃꝺiceꞅꝼoꞃꝺ on the Avon, where he defeated the Britons in 519 is now called Charford (near Fordingbridge in Hampshire) and Ceꞃꝺiceꞅleaᵹ, where he fought another bloody battle in 527, is supposed to be Chardsley in Buckinghamshire. The affinity between Charmouth and the present names of these two places, seems fully to sanction the conclusion I have drawn, which is also favored by other circumstances; the adjoining village on the east is called Chedick; at a short distance on the west is Charton bay; and a few miles to the north is the town of Chard in Somersetshire.* Some traditional importance must have been attached to Charmouth, for many writers, and among them Camden, Gibson and Ingram (the two latter apparently copying from the former), point it out as the Caꞃꞃum of the Saxon Chronicle,† where the Danes defeated Egbert in 833 and Ethelwulf in 840. No authority has ever been quoted for this assertion, nor is there a single passage in the Chronicle, by which it is in the least supported. If the similarity of the present name be a legitimate guide, it would be much more reasonable to fix this Caꞃꞃum at Carhamton* or Carenton, a village in Somersetshire on the coast of the Bristol Channel, which may easily have been formed by adding the common termination *ton* to the ancient name. This village is also near the mouth of the Parret, where the Danes were defeated in 845,† and in the immediate neighbourhood of Watchet and Portlock, the ƿeceꝺ and Poꞃꞇlocan of the Chronicle,‡ both of which were afterwards attacked by these pirates. These speculations are, however, only incidental to the main point, which they appear to corroborate, viz. that Ceꞃꝺıceꞅoꞃa has been considered to be part of the coast of Norfolk without sufficient authority, and contrary to all historical and chorographical evidence.

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* De Luc's Geological Travels in England, vol. 2, pp. 87, 88.

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* To those who are not acquainted with Anglo Saxon, it may be necessary to observe, that, in that language, the letter C before *e* had, as in modern Italian, the sound of *Ch; Cester* was pronounced *Chester*. Both Dorsetshire and Somersetshire abound in places, that seem to have taken their appellations from the founder of the kingdom of Wessex, and whose earlier names, as given in the Domesday Book, preserve most distinctly the traces of their derivation. Chardstock, not far from Charmouth, was then Cerdestoche; and Charlinch, near Bridgewater, was Cerdesling. The situation of this latter place points it out, as far more likely than Chardsley in Buckinghamshire, to have been the Ceꞃdıceꞅleaᵹ of the Chronicle.

† Gibson's Edition, pp. 72 and 74. Ingram's, pp. 89 and 91. Milton and Brady, in their Histories of England, concur in rendering Caꞃꞃum *the River Carr;* but I see no sufficient reason for rejecting the authority of older writers, by all of whom it is designated as a place. Matthew of Westminster, in his account of the battle with the Danes in 833, says expressly, "*in loco qui Carrum nuncupatur.*"

East Anglia was the theatre of many disastrous conflicts with the Danes, in the course of which may be noticed some occurrences, that plainly indicate the state of these vallies to have been, at that period, such as I have described. The adventures of Lothbroc, as related by Higden, Spelman, and other writers, have a tinge of the legendary and marvellous, which gives to the whole story the character of a fiction, invented by Monkish ingenuity, in order to heighten the effect of the subsequent massacre and canonization of St. Edmund. Yet the principal objection, opposed to the credibility of the narrative, is the difficulty of reconciling its main incident with the present topography of the district; the change, which a thousand years may have produced in the face of the country, did not occur to those writers, who have gravely argued upon the impossibility of a storm-driven vessel being carried from the open sea, to a distance of many miles, up the winding course of a narrow river, before its progress could be stopped. We shall find, in fact, nothing very surprising or impossible in what befel this Dane, if we consider that the whole level of marshes and meadows, from the present coast up to Norwich, was at that time covered by the waters of the ocean. A vessel driven by a north-east wind into the entrance of this arm of the sea, near Caistor, would be taken, equally by the direction of the gale and the current of the tide, in a straight course towards that point where Reedham now stands. This explanation will both obviate the necessity for a circuitous passage between the narrow banks of a river, not then in existence, and account for the distressed navigator having received no assistance from the inhabitants of the country, till he reached that remote point of the present interior, where he is said to have landed. Admitting, however, that the tale is entirely fabulous, still the author of it would not have selected Reedham, as the spot on which to land his ship-wrecked hero, if from the form of the coast such an event had been as destitute of probability then as it would be at the present day. Poets are not always required to be geographers, and may be pardoned if they sometimes send ships to Bohemia; but even a legendary tale would have roused the suspicions of the most credulous, if its principal event had been at variance with the physical circumstances of the province in which it was composed.

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* Peter of Langtoft's Chronicle, which was written about the year 1300, calls the place where Egbert was defeated by the Danes, Karham. (Hearne's Works, vol. 3. p. 16.) In King Alfred's will the present Carhamton bears the name of Caꞃumꞇune. (Gough's Introduction to Camden, p. 115.) Stow in his Chronicle (p. 77) calls the place, where Egbert was defeated, Carham.

† Ingram, p. 92.

‡ Ib. p. 132.

Some historians have asserted that this district was the first part of England, in which the Danes began their dreadful visitations.* The evidence of this fact is not very clear; but it is certain, that at a later period of these incursions, the fleet of Sweyn conveyed his predatory bands up to the walls of Norwich. The Saxon Chronicle relates this event in terms so explicit, that they cannot be mistaken. "A.D. 1004. This year came Sweyen with his fleet to Norwich,"† is a literal translation of the record. It is true that these vessels did not draw a great depth of water; but no invading fleet would have ventured thirty miles into the heart of an enemy's country, up so narrow a stream as the present Yare, where it must have been constantly exposed to attacks in such situations, that superior seamanship and naval force would have been unavailing, against a few desperate and resolute defenders of their native soil. Rather than encounter such hazards they would have left their ships in a secure station, and marched their army by land; since they did not, in this instance, pursue such a course, we may infer that the whole valley was at that period navigable, and that this fleet was still floating upon a wide arm of that element, of which these roving marauders were then the undisputed and irresistible masters.* The subsequent operations of the expedition render this fact still more evident. Norwich having been plundered and burnt, the council of East Anglia were negociating in order to purchase peace of the enemy. "Then," proceeds the Chronicle, "under the truce that should have been between them, stole the army up from their ships, and bent their course to Thetford. When Ulfkytel understood that, then he sent an order to hew their ships in pieces; but they frustrated his design." Here then we see, that the Danes, while masters of Norwich, still had their fleet with them; and that, during the absence of their main army, their ships were in perfect security, although protected by an inconsiderable force,* against one of their most active and formidable enemies.

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* Sir John Spelman (son of Sir Henry) in his Life of Alfred, p. 11, says, "in East Angliæ certé regnum primó pedem intulerunt (Dani).

† Ingram, p. 177. I have followed Ingram's version of this event, which, in one material point, differs from that given by preceding translators. The sentence in my next extract, which he renders, *they* (meaning the Danes) *frustrated his designs*, stands thus in Gibson's edition (p. 134), *at illi perficere negligebant consilium ejus*, which Blomefield (8vo. edit. vol. 3, p. 7) has Englished, *but they* (meaning the people of the country) *neglected to perform that command.* Florence of Worcester also represents the affair in the same light; he says (p. 611) *Illi vel non audebant, aut jussa perficere negligebant.* The following is the original Anglo Saxon: Ða Ulꝼcẏꞇel ꝥ unꝺeꞃᵹeaꞇ þa ꞅeonꝺe he ꝥ Man ꞅceolꝺe þa ꞅcıpu ꞇo heapan ac hı abꞃuðon þa þe he ꞇo þohꞇe; the literal meaning of which is, *when Ulfkytel understood that, he sent that one should destroy their ships, but they rendered ineffectual what he thought of.* The whole construction of this passage implies, that the safety of the fleet was to be ascribed to the active precautions of the invaders, not to the passive supineness of the invaded.

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* It appears that England was at this time quite destitute of ships. A tribe of successful pirates, like the Saxons, so suddenly changing their habits, and, in the pursuit of territorial dominion, utterly neglecting the force, by which their first triumphs were obtained, presents a singular spectacle. Alfred created a navy in order to oppose the Danes; but neither his example, nor the experience of the advantage which he derived from this measure, could turn the attention of his descendants to these obvious and natural means of insular defence; after his death they became gradually less efficacious and were at last abandoned. Ethelred, in the year 1008, made a vigorous effort to equip a fleet; but the historian of that age was obliged to record its failure, and observes, "we have not yet had the prosperity and the honor, that the naval armament should be useful to this land, any more than it often before was." (P. 182.)

The next document to which I have to refer is Domesday Book. This authentic register of every description of property at that period existing in the kingdom, enables us, in many instances, to trace, with precision, the changes which seven centuries have produced; and it furnishes at least one piece of curious and valuable information, connected with the subject of this enquiry. Amongst the arable and pasture lands, the heaths, the sheep-walks, the woods, the mills and the other items, which then formed the substantial wealth of the district, we find also a considerable number of salinæ† or salt works. These could only have been reservoirs, into which the brine of the sea was admitted at the flow of the tide, and retained for the purpose of making salt, by the evaporation of the water in which it was held in solution. This simple method of preparing that useful commodity was in early practice among the Romans,* and by them it was most probably taught to the conquered Britons. In no other natural form could the article ever have been produced in this neighbourhood, and the idea of its importation, at that time, in its raw state, in order to be manufactured here, would be in accordance neither with the spirit of the age, to which we are looking back, nor with the great numbers, in which we find those works scattered over this part of the country. I have subjoined in a note† a list of the

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* Levi præsidio navibus relicto. Polydore Virgil, p. 120.

† This word is generally entered in the abbreviated form of *sal.* which has not only been admitted by all antiquaries to mean salinæ (Blomfield and Parkins, vol. 9, p. 42), but there are also a few instances in which it has been fully expressed as *salin. saline*, and *salinæ*. The salt-works in Cheshire and Worcestershire, are designated by the same term, which cannot therefore be rendered, in this instance, *salt marshes*, as it is translated in Rees' Encyclopædia.

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* As soon as Ancus Marcius had extended the territory of Rome to the sea coast, he established salt works there. Livy, book 1, chap. 33. Silva Mæsia Vejentibus adempta, usque ad mare imperium prolatum et in ore Tiberis Ostia urbs condita; salinæ circà factæ. Pliny, book 30, chap. 7, De generibus salis, refers to these as the first works of the kind among the Romans. Ancus Marcius Rex—salinas primus instituit; and he describes the process used in them. Vulgaris plurimusque in salinis, mari adfuso, non sine aquæ dulcis riguis, sed imbre maximé juvante, ac super omnia sole multo, non aliter inarescens.

† The following are the salt-works mentioned by the Domesday Book on the eastern side of Norfolk and in the adjacent parts of Suffolk.

Caistor	29	Clippesby	1
Mautby	11	Somerton	3
Runham	19	Winterton	1
Herriugby	6	Burgh	2
Stokesby	3	South Walsham	3
Thrickby	6	Halvergate	1
Filby	9	Burgh Castle	3
Rollesby	1	Gorleston	3
Hemesby	2		

places where they were found, from which it will be seen that they existed in almost all the villages of the

In the western vallies of Norfolk, which open to the æstuary of the wash at Lynn, there was at the same period a similar distribution of salt works. The Roman town, Salinæ or Salenæ, which Ptolemy mentions in the country of the Cattieuchlani, (Cassivellauni or Cassii), and which Camden places at Sandy in Bedfordshire, must have taken its name from works of this description, and must therefore have stood in some situation, accessible at that period to the flow of the salt tides. In Ptolemy's map it is delineated as standing on the shores of the Metaris. As the Romans gave this appellation to many places in other provinces, at all of which it is known that salt works existed, the meaning of the ancient, rather than the doubtful resemblance of a modern name, ought to have been Camden's guide in determining the site of this station. The southern part of Lincolnshire was most probably a portion of the territory of the Cattieuchlani; and in all the elevated grounds near the Wash, many Roman antiquities have been found, not only urns, coins, and armour, but at Spalding there have been discovered some cisterns, and at Whaplode clay pipes, that were well adapted for use in the salt works. On the range of sand hills about Holbeach and Gedney, there are also many square enclosures, which may have been subservient to the same purpose. (See Gough's Camden, vol. 2, pp. 234, 235, 237, 238.) It appears also from Domesday Book, that at the time of the Conquest, there was a greater abundance of Salinæ in this neighbourhood than even in Norfolk. They were numerous at Fleet, Gosberton, Frampton, Kirkton, Bicker, and other places, some of which are now remote from the coast.

The sandy rising grounds, near Sutterton, are still denominated Salt Hills. (Gough's Camden, vol. 2, p. 223.) At Denton is an ancient Roman way, now called the Salter's Road, pointing towards the east, and of which there appears to be a continuation at Spalding, Moulton, and Gedney. (Ib. 251 and 239.) Mr. Leman, in his Commentary on the Itinerary of Richard of Cirencester, (p. 116) mentions two salt ways, one of which "appears to have been a communication between *the sea coast of Lincolnshire*, and the salt mines of Droitwich." It is surely more probable that this Salter's Road should have derived its name from works in its immediate neighbourhood, Flegg hundreds; but most abundantly in those which occupy the line of the southern escarpment from

than from others on the western side of the island, with which its connection is also very problematical; and this opinion is strongly confirmed by the additional fact, that a branch of the river Nen, which forms the communication between this district, in Lincolnshire, and Ramsey Mere, in Huntingdonshire, is called the Salter's Load. (Gough's Camden, vol. 2, p. 167.) The other, or lower, salt way is supposed by Mr. Leman to have extended from the same point, viz. Droitwich, to the coast of Hampshire, where also Domesday Book records many salinæ at the period of the survey. They were found at Eling, Crofton, Bedhampton, Dibden, Burhunt, Hordle, Cosham, Haling, and various other places, near the shore, or on the banks of Southampton water, where the same process in the manufacture of salt was carried on at a much later date, (Gibson's Camden, p. 128), and is even still continued. (Rees' Encyclopædia—Article, Salt Marshes.)

Richard of Cirencester (book 1, chap. 6, xxviii.) confounds the Salinæ of Ptolemy with another station of the same name, which appears to be the present Droitwich. There were undoubtedly several towns of this name in Roman Britain. The geography of Ravennas mentions two; one near Glevum (Glocester) which is now Droitwich, and another near Deva (Chester) which corresponds with the modern Nantwich. In the ninth Iter of Richard of Cirencester there occurs also an Ad Selinam; but this appears to me to be an error; for, as the place referred to was on the river Cullen, in Scotland, the ancient name of which was Celnius, I have no doubt that Ad Selinam should be Ad Celnium. The situation of Ptolemy's Salinæ is, however, so clearly indicated, between the country of the Coritani, or Lincolnshire, and that of the Simeni (or Iceni) which is Norfolk, that it would be impossible to place it in either Worcestershire or Cheshire. My opinion on this subject is supported by the following passage in Whitaker's History of Manchester, although that learned writer has been betrayed into a material error on one point, by trusting too implicitly to the fallacious authority of Camden. He says (vol. 2, 8vo. edit. p. 165), "The Romans had long been instructed to search for the springs of brine in the ground, and to boil the water into cakes. And they actually opened some pits before the middle of the second century. The first were probably the salinæ, Stokesby to Caistor; even Halvergate and South Walsham, which are seven or eight miles distant from the present coast, and to which no brine could ever have been conveyed through the circuitous channels of the now existing rivers, had their salt pans; and in every instance they were situated on the immediate borders of some part of these vallies, which are thus proved to have been overflowed by sea water in the year 1086, when the survey of Norfolk was completed, and 82 years after the expedition of Sweyn. It must also be remarked that Domesday Book gives no account of any of those extensive tracts of marsh land, now belonging to these villages, which, if they had existed at that time, would certainly not have been omitted in the minute details of that singular document.

All our historians and topographers, who make mention of Great Yarmouth, concur in stating, that the site of that populous town was, at the beginning

which were situated in the country of the Cattieuchlani or Cassii, and perhaps at Salndy in Bedfordshire, which are expressly mentioned by Ptolemy, but are now unknown and lost." From the geological characters of the district, in which Sandy is situated, we may be certain that it never produced any salt springs; and we can therefore only look for these salinæ in some place, where the brine was supplied by the waters of the ocean. The proofs of the existence of Roman salt works, on the shores of the Metaris, are conclusive; and, corroborated by such evidence, the authority of Ptolemy for there having been in that quarter a town called Salinæ, is no less decisive, than that which has fixed stations of the same name at Droitwich and Nantwich. I have been led to investigate this point so minutely, on account of its connection with the salinæ of the Norfolk vallies, and the light which it throws upon the nature of them.

of the Christian æra, a sand bank in the entrance of an arm of the sea; that this shoal became an island, on which fishermen first pitched their summer tents, and by degrees established a permanent abode; and that the growth of this community kept pace with the encreasing security of the situation. Spelman, in his Icenia,* says that this ground first became firm and habitable about the year 1008. Domesday Book refers to a survey made by Edward the Confessor, at which time, about A. D. 1050, Yarmouth is said to have had seventy burgesses. Yet as its name does not occur in the Saxon Chronicle, we may conclude that it did not exist at the period of Sweyn's irruption, for he must have passed it on his way to Norwich, and it could not have escaped his rapacity, if it had been an object worthy of plunder. Swinden, whose history of this place is compiled entirely from local records, informs us (pp. 20 and 373), that the ground on which it stands, was an island till about the 20th of Edward III. A.D. 1347. At that period the northern channel between Yarmouth and Caistor, known by the names of Grub's Haven and Cockle Water, which began to be choked with sand soon after the Conquest, was entirely closed; and "many thousand acres of marsh or meadow land became dry (which had before constantly been overflowed by the sea) and in time produced good pasturage for cattle."

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* Reliquiæ, p. 154. Arenam obruisse fluvius dicitur usque ad Canuti Regis tempora, An. circiter 1008. Cedente verò tunc mari, et arenis indies latiùs atque firmiùs semet efferentibus, conveniunt illic sub Eduardo Confessore et ingressu Normannorum, non tamen Norwicenses, &c.

Ancient records prove not only that Norwich was formerly accessible to ships of burden, but that it actually possessed the privileges of a *port*. In the year 1075 Ralph Guader took shipping at his Castle of Norwich, and fled to Britanny, in France.* In 1249 the citizens of Norwich "sued the burgesses of Yarmouth for not permitting their ships to come laden with goods and merchandizes to the city, as they always did in time past, and for detaining them there."† In 1327 this suit was revived, when the citizens pleaded, "that Norwich was a mercantile and trading town, and one of the royal cities of England, situate on the bank of a water and arm of the sea, which extended from thence to the main ocean, upon which ships, boats, and other vessels have immemorially come to their market"—"that all foreign merchants paid all their customs at Norwich, which was the then *port*, and in the King's hands, namely 4d. every ship of bulk and 2d. every boat."‡ Lothingland remained an island to a much later period. Kirkley road,§ the ancient mouth of the most southerly branch of the Garienis, was a much frequented port till the 14th century, when the citizens of Yarmouth obtained a charter, which extended their jurisdiction over it in the 46th of Edward III. A.D. 1373. From that time its importance declined; no exertions were used to remove the bar of sand and shingle which accumulated at its entrance, and by which the navigation was gradually impeded; but it was not till the beginning of the last century, that all communication was cut off between the sea and Lake Lothing, for it appears, that in the year 1712, the proprietors of the marshes along the course of the Waveney, embanked this isthmus, in order to prevent the inundations to which their lands were subject from high tides.* The period at which the northern or Horsea branch ceased to be navigable, cannot be precisely ascertained; but it is well known, that till within the last forty or fifty years, the sea frequently broke through the line of the present coast, sweeping over large tracts of the lowland district, and seeming to re-assert its former dominion over the verdant levels of those extensive meadows.

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* Saxon Chronicle. Ingram, p. 281. Florence of Worcester, p. 638.

† Blomefield, 8vo. edition, vol. 3, p. 47.

‡ Ib. p. 81.

§ It is at this point that the new navigation from Norwich proposes to communicate with the sea; and it will thus restore, what appears to have been the most direct and commodious passage from the province of Icenia to the ocean.

In the mass of evidence which I have now examined, the phænomena of nature and the works of man—the relics of past ages—the land-marks of progressive civilization—and the authority of historical records—all concur to prove that the eastern vallies of Norfolk were formerly branches of a wide æstuary, and that their present rivers and lakes are the remains of that large body of water, by which their surface was overspread, even in times comparatively recent. Of the fact itself, it seems impossible to entertain a doubt; the only question is—how has the change been effected? By what means have these mighty floods been expelled or withdrawn from their ancient beds? Certainly not by the land rising above the level of the sea; for not only is it an axiom in such questions, that water forms no extensive and permanent deposits above its own surface—but in this case we have the traces of the ancient beach, on both sides of the valley, more than forty feet above the intervening meadows. The basin therefore has not been filled up—the space once occupied by the waters is still empty—they have not been expelled by any accumulating detritus or solid matter introduced into their place. Nor has the unruly element excluded itself by choking with sand banks the passages, at which it formerly entered; for, though the shores that now extend across these inlets, were unquestionably washed up by the conflict of meeting tides and the fury of our easterly gales—still it is physically impossible that water, even in a state of the most impetuous agitation, should raise any permanent barrier against its own course. Supposing it to retain the same level, its waves must always be capable of sweeping away, at one time, what they may have washed up at another.* If the German Ocean still maintained the same height, as when it formed the flat sandy tract between Caistor and Gorleston, it must, at least occasionally overflow the mounds which it then raised; but in no instance for many ages, has any gale, however tremendous, or any flow of the tide, however unusually high, carried the surges over this part of their ancient bed, although it has been compacted and depressed by the weight of massy buildings, and the traffic of a numerous and busy population. Yet this portion of our coast, though at present never surmounted by the assailing waves, is still considerably below the line of their ancient elevation, as marked along the sides of the neighbouring hills. It is not therefore these marigenous banks, which prevent the return of the floods that once filled our vallies; and in this instance there is a peculiar and striking fact, which completely proves that the incursions of the sea are not stopped by this supposed obstacle. The entrance at Yarmouth haven admits the tide freely, which often runs up even to Norwich, yet in the whole course of the navigation to that city, there is not a single sluice-gate, or any continuous line of embankment. In the sister streams of the Bure and Waveney, which flow into the sea at the same point, it has been found that the remoter parts would cease to be navigable, if the intervention of locks did not prevent the water being drawn off to a lower level. If then the sea still remained at its original elevation, entering at this aperture, it would necessarily descend into these vallies and continue to occupy them, as in former times. As this is not the case, it follows of course (unless every established principle of hydrostatics is to be rejected as delusive and unnatural) that the change here observed is the result of *a depression in the level*

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* Gillingwater's History of Lowestoff, p. 32.

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* The disappearance of the Scrothy sand in the year 1582, is a striking illustration of my argument. This bank having been gradually raised by high tides, so as to form an island at a short distance from this coast, was at last carried away during a violent storm, at the very period, when the lord of the adjoining manor and the corporation of Yarmouth were preparing to dispute for the possession of it.

of the German Ocean itself, which is now at least forty feet below the height, where there is evidence of its having been stationary at some distant period.

The gradual progress of such a revolution, although so slow as scarcely to amount to a perceptible sum during the common term of human life, may still be traced by comparing facts recorded at different intervals of time.

The situation of part of the walls at Burgh Castle, being below the line of the ancient beach, proves that the surface of the water had fallen, previously to the æra, in which those works were erected; but in order to carry the Roman vessels up to that fortress, and give security to its unguarded side, the tides must at that period have risen at least ten or twelve feet above their present highest level.

The unquestionable proofs, afforded by Domesday Book, of the sea having flowed, at the time of the Conquest, up to many villages, that are now remote from the coast, indicate that the general range of its waters must then have been about six feet higher than they now reach.

In 1228 an inquisition was taken at Yarmouth,* which shews that the inhabitants of the Lothingland or Southtown bank of the river were exposed to frequent inundations from the sea, such as never occur now; and in 1287 the tide flowed into St. Nicholas' church at Yarmouth to the height of four feet, and great part of the town was under water;† in both which cases the German Ocean must have risen full four feet above the highest point to which of late years it has ever attained.

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* Swinden, p. 66.

† Swinden, p. 922, and Blomefield and Parkins, vol. 11, p 394.

In 1347 the Caistor channel was stopped up, and the neighbouring meadow lands began to be left dry.

In 1549, during Kett's rebellion,* a pinnace manned with 26 men was sent by the magistrates of Yarmouth up the Waveney as far as Waybridge, (the present Weybread) which is several miles beyond the point, to which that river is now navigable.

In 1559, after the opening of the present haven, the whole level of the marshes up to Norwich was overflowed, so that "keles and boats passed over them,"† which would require a body of water at least from two to three feet deeper than any flood now produces.

Since that period, the inundations on the banks of the rivers in these vallies have, in each succeeding century, become less frequent and less extensive; nor do we now witness any of those desolating floods, the ravages of which are so constantly described in our ancient chronicles.‡ This change has in some measure been ascribed to the improvements made in the operations of draining; but as we experience no deficiency in our land springs, and as the water displaced by the draining mills is uniformly conveyed into the rivers, it would of course tend rather to swell, than to decrease, the streams into which it is discharged, and in which the oldest and most experienced navigators inform me, that they have observed a sensible lowering of the average surface within the last sixty or seventy years. This observation is also still further confirmed by the fact, that at all the public staithes in Norwich, the water has of late frequently been found to be out of the reach of the inhabitants, and the corporation has recently directed an additional step to be constructed at the foot of each, in order to remedy the inconvenience. The wide expanse of Breydon, a large lake formed by the junction of these rivers near Yarmouth, is now no longer navigable, except in the channel which is kept open by the current of the tides; the accretion of mud, formed on either side of this line, is frequently left dry, and the idea has been entertained of converting it into meadow land by embankment. To this must also be added the incessant labor and immense annual expense required, in order to keep open the mouth of the haven, through which the Yare and its tributary streams discharge themselves into the German Ocean; and it might perhaps be well, if the conservators of our rivers, and the skilful engineers in whom they confide, were to direct their enquiries to this point, and ascertain how far the constantly encreasing difficulties of river navigation, in this part of the globe, may arise from a progressive depression in the level of the adjacent sea. That such a depression has been uniformly going on, at this point, from the remotest antiquity, can scarcely be doubted. The line of a former beach along the sides of hills, twenty miles distant from the existing coast, shews that the sea once filled the interior vallies to the height of forty feet above their present surface. Historical documents prove that these channels subsequently admitted the waters of the ocean, although at intermediate elevations and to points less remote. We now see them for the greater part left dry—the islands which they once formed are now inseparably attached to the main land—the sand banks which they once washed, are now covered with the dwellings of a numerous and active population—and the vallies over which they once spread the ocean tides, have been gradually advancing from the condition of swampy and unwholesome fens, to the firmness of productive meadows and luxuriant pastures. The rate at which this change has proceeded, might probably be calculated with mathematical precision; the data are rather uncertain, but they seem to indicate that the level of the sea has been regularly falling about eight or nine inches in every hundred years, which would carry back the period of its greatest elevation to about six thousand years ago. At all events, however, it is manifest, that this change has not been produced by any violent catastrophe or awful convulsion of nature; but that it has been a slow and gradually working process, denoting the regular operations of fixed laws, and carrying into effect the benevolent designs and permanent objects of Creative Power.

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* Swinden, p. 939.

† Ib. p. 411.

‡ Blomefield, 8vo. edition, vol. 3, pp. 53, 63, 66, 96, 194, 295, 355, 366, 392, 414, 426, 432, 448.

I have now laid before the reader a series of facts, presenting the most decided evidence of a change in the relative levels of land and sea, at one point of our coast. In the present advanced stage of geological science, it is unnecessary to prove, that the land has not risen; the natural inference, therefore, is that which I have adopted, namely, that the surface of the sea must have been depressed. I have selected this fact, not merely from its coming so immediately under my personal observation, and from its striking illustration of the universal process, by which our continents have been formed; but also because it exhibits, in the most unquestionable shape, that precise class of phænomena, the existence of which has been so strenuously denied by many respectable and intelligent writers. Cuvier,* De Luc,† and most of those eminent men, by whose laborious researches and accurate views geology has so much benefited, have uniformly maintained, that no alteration in the height of the waters of the ocean has taken place for many ages. The following argument is used by one of these authors in his reply to Professor Playfair: "If indeed the depression of the level of these seas were a matter of certainty, the best authenticated, and the least equivocal, monuments of their change, would then abound along their coasts. But proofs are every where found that such a change is chimerical; they may be seen in all the vales coming down to those seas, in which there is no perceptible impression of the action of any waters, but those of the land, and no vestige, through their whole extent, of any permanent abode of those of the sea."*

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* Recherches sur les Ossemens fossiles; seconde Edition. Discours préliminaire, p. 17.

† Geological Travels, vol. 1, p. 104.

It is impossible to suspect such writers of intentional misrepresentation; and it is almost equally difficult to charge them with a careless and superficial survey of the cases which they have investigated. Yet the eastern vallies of Norfolk afford, throughout the whole of their extent, those clear traces of the former residence of the sea, which, M. De Luc here says, are not to be found in any such districts; and the gradual retreat of its waters is, in this instance, matter almost of positive historical record.

No general principle can, however, be established by a solitary isolated fact. Having begun my enquiry by ascertaining the nature of one of the latest earth-forming processes, that can be traced on the surface of our globe, I shall hereafter proceed, according to the second law of investigation which I have laid down, to compare and connect this circumstance, on the most extensive scale, with numerous observations made on the shores of every ocean. I shall thus meet M. De Luc on his own ground; along the whole coast of Great Britain—in the circuit of the German Ocean—in the Irish, the Baltic, and North Seas—in the English Channel—in the Mediterranean—the Black

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* De Luc's Geological Travels in the North of Europe, vol. 1, p. 338.

Sea and Sea of Asof—in the Gulph of Venice and that of Mexico—I will shew the traces of the retiring waves; while an opposite class of phænomena will demonstrate the rising level of the Indian and Pacific Oceans. If then I should succeed (as I have no doubt that I shall) in adducing satisfactory proofs of these apparently inconsistent facts, it will then only remain for me to reconcile such seeming contradictions, by shewing, that there is still in operation a law of nature, effecting a gradual transfer of the waters of the ocean from one part of the globe to the other—not according to the vague, hypothetical conjecture of Buffon—but upon principles experimentally established and practically confirmed.

Before, however, I leave the coast of Norfolk, it may be necessary to explain some circumstances, which, on a cursory view, appear to indicate changes, quite contrary to that which I am endeavouring to prove. These are cases, in which the sea is either known to have washed away, at former periods, considerable portions of the then existing land, or is seen to be extending its encroachments even at the present day. It is, without doubt, by such an abrasion of declivities, once gently sloping, that the steep cliffs have been formed along the north-eastern coast of this county, and nearly the whole of that of Suffolk; and the destructive consequences of this process have been manifested at Cromer, Dunwich, Aldborough, and other places, where whole streets, with houses and churches, have been engulphed in the tempestuous waves. In none of these instances, is there any evidence of a rising level of the sea; but on the contrary, the nature of the past changes, and the manner, in which their farther progress seems at most points to have been arrested, appear to indicate the former action of agitated waters at a much greater height, than they are now ever known to reach. There may still be places, where the eddy of a current, from particular local circumstances, is wearing away some prominent head-land or indented beach—or where, during heavy gales, the lashing surge may beat against and destroy the base of some overhanging cliff; but the cause of decay most frequently in action now, is to be found in the land springs, by which the elevated parts of our coast are often extensively undermined. By these means, especially in rainy seasons, whole acres are sometimes precipitated upon the strand below, within reach of high tides and stormy seas, by which they are soon washed away, and converted into that bed of fine sand and rolled pebbles, which at low water is generally seen along all our shores. The remarks of M. De Luc on this point are worthy of attention; for, though some of his general conclusions may have been overthrown by facts, which escaped his notice, or which have been subsequently brought to light, still he was, for the most part, accurate in his observations upon what he actually saw. "I have had many opportunities," he says, "of studying the strands or beaches along various steep coasts; very few of these are still attacked by the sea itself; they are mostly impaired by the land water filtrating in them, which, in loosening the materials, brings down sometimes large masses of them within the reach of the waves." From Dale's History of Harwich* it appears that the cliff in that neighbourhood, which is a continuation of those on the coasts of Norfolk and Suffolk, has long been wearing away from the same causes. "Large falls of the cliff," as that author observes, "are occasioned, either by the springs within the hill, or by the sea undermining it from without. This I was an eye-witness to, in the summer of 1698, when, having, with two gentlemen, been viewing the said cliff, we were but a little removed from the place, when a great quantity of earth fell down; and within the compass of about forty years, some acres of land have fallen down." The encroachments of the sea upon the steep rocky coast of St. Andrews, in Scotland, are described by M. Faujas St. Fond† with a minute fidelity, which proves, that these are not the effects of any elevation of the surface of the waters, but that "it is a circumstance purely local, which has occasioned this accidental invasion." In this instance indeed the labors of man have greatly assisted, and perhaps were the original cause of, the inroads of the sea, by working quarries at low water, into which the returning tide flowed, and by enlarging these cavities, destroyed the foundation of the superincumbent mass.

I have referred more particularly to these two cases, both because they display the action of the waves upon precipitous shores, composed of very different materials, the one being a bank of sand and gravel on a bed of clay, and the other a solid pile of stone—

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* Page 99, and note.

† Travels in England and Scotland, Vol. 2, p. 208–211.

and also, because the spots, where they occur, present other appearances, to which I shall hereafter advert, and which indicate most decidedly a progressive lowering of the surface of the ocean. To these may also be added the Reculver cliff, near the mouth of the Thames, which for many ages has been gradually wearing away; yet several places, both on the Kent and Essex sides of that river, afford undoubted proofs, that the whole extensive valley through which it flows, was at no very distant period filled by the waters of the present ocean, occupying at that time an elevation of many feet above the highest point, to which they are now ever known to rise.

There are likewise coasts, in some parts of Europe, which, from another cause, are subject to occasional incursions of the sea; this is, where alluvial land has been embanked and cultivated, before it was sufficiently firm, which is the real cause of the danger to which the country of Holland is continually exposed at the time of high tides in conjunction with westerly gales, and of the inundations, by which early settlements on newly-formed islands have been so frequently destroyed. But the very nature of these districts proves them to have been formed of the sediment recently deposited at the bottom of the sea, and left dry by the subsidence of the waters; and hence it is obvious, that such inroads of the surrounding floods, as we are now considering, are only effects of some extraordinary swell, producing a transient re-occupation of part of their former beds.

On these principles every instance of the sea "gaining upon the land," in this quarter of the globe, will admit of an explanation perfectly consistent with the fact of an extensive and constant depression of the level of its waters. The proofs of this fact have been, in a great measure, obliterated, in part by the almost universal abrasion of the ancient face of every coast, and in part by the works of agriculture, and the spread of vegetation on the shelving skirts of those low vallies, that descend towards the shore. This destruction of the evidence that he required, was overlooked by M. De Luc, when he considered himself justified, by the want of it, to impugn as "chimerical" that opinion, which could otherwise never have been controverted. Sufficient testimony, however, still remains to establish the fact; in some of the cases, which I shall have to cite, the appearances correspond even in minute particulars, with those which I have described in the eastern vallies of Norfolk; in all of them the phænomena are analogous, and afford the most unequivocal and decided support to the conclusions, which in that case have been the result of long enquiry and actual observation.

Additions to the Note on the Garienis, p. 23.

When my remarks on the Garienis were sent to the press, I supposed my etymology of the name of that river to be original. I have since found the same interpretation of it, given by two writers. It occurs first in Baxter's Glossarium Antiquitatum Britannicarum, published in 1719, where Garioneuum (Garianonum) is said to be formed from the British "*Garii aün eneu*—the mouth of the rough river." I have not been able to consult this work, and therefore quote it from Campbell's Political Survey of Britain, vol. 1, p. 143. The other passage is of a more recent date; in Chalmers' Caledonia (vol. 2, p. 968), I find the following observations on the river Yarrow. "Its whole course of twenty-one miles is on a rocky and gravelly bottom, and it is the roughest and most precipitous river in this country. It was from this quality that it obtained from the British people its remarkable name; *Garw* in their language, *Garow*, in the Cornish, and *Garbh*, which in the Gaelic has the same pronunciation, signify what is rough, or a torrent. And this descriptive name was applied by the Britons to several mountain torrents, both in North and South Britain.—The same change of G into Y has taken place in the names of the Yarrow river in Lancashire, and Yore water in Norfolk, from which Yarmouth derives its name, and Yare which falls into the Ax in Devonshire." (Yore water is evidently an incorrect designation of our Yare.)

Having also had an opportunity of referring to Armstrong's Gaelic Dictionary, I must not omit to notice the following extract from his remarks on the word, *Abhainn*; "Garumnus—Garonne—is *Garbh-an*, the rough water."

I can relinquish, without regret, my claim to the palm of originality, when I obtain, in exchange, the satisfaction of finding my opinions supported by respectable authorities. Baxter's Glossary has been so long before the public, that his derivation of the Garienis cannot have been unknown to all, who have subsequently written on the antiquities and topography of Norfolk. But I presume that it was rejected by them, from the difficulty of conceiving, that a stream, so smooth, so placid, so sluggish even, as our present Yare, could ever have been denominated *the rough river*. Nothing, indeed, but the concurrent memorials of its former state, could induce us to admit an etymology, which, however clear it may be to the linguist, is most decidedly at variance with the existing characters of the object designated. That etymology, however, and those memorials, by their unquestionable coincidence, mutually support each other, and indicate the same course in the revolutions of nature; nor do I think it improbable, that, in like manner, much of the obscurity, which hangs over early historical events, and many of the doubts, by which antiquarians are perplexed, might be removed by investigating, in other districts, the progress of changes, similar to that which has taken place in the eastern vallies of Norfolk.

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